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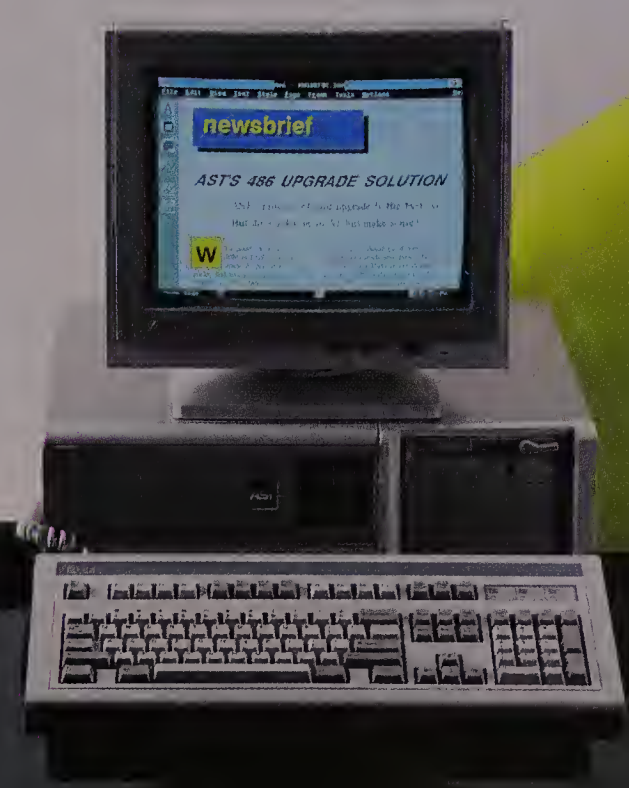

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February 14, 1989

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STANDARD FEATURES:

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- Choice of 1 MB, 2 MB, or 4 MB of RAM* expandable to 16 MB (using a dedicated high-speed 32-bit memory slot).
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 20 MHz Intel 80387 or 20 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard drive controller.
- Enhanced 101-key keyboard.
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△ Extended Service Plan pricing starts at $251.

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Prices listed reflect 1 MB of RAM. 150 and 322 MB hard drive configurations also available.

**Performance Enhancements (Systems 325, 310, 316 and 220): within the first megabyte of memory, 384 KB of memory is reserved for use by the system to enhance performance. 4 MB configurations available on all systems. Call for pricing.*

THE DELL SYSTEM® 316
16 MHz 386SX.™

Expandable, affordable access to 386 architecture.

STANDARD FEATURES:

- Intel 80386SX microprocessor running at 16 MHz.
- Choice of 1 MB, 2 MB, or 4 MB of RAM* expandable to 16 MB (8 MB on the system board).
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- LIM 4.0 support for memory over 1 MB.
- Socket for 16 MHz Intel 80387SX math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk drive interface and diskette controller on system board. (ESDI based systems include a hard disk controller.)
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots (7 available).

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Prices listed reflect 1 MB of RAM. 150 and 322 MB hard drive configurations also available.

THE DELL SYSTEM® 220
20 MHz 286.

It's faster than many 386 computers, and has a smaller footprint.

STANDARD FEATURES:

- 80286 microprocessor running at 20 MHz.
- Choice of 1 MB, 2 MB, or 4 MB of RAM* expandable to 16 MB (8 MB on system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 1 MB.
- Integrated diskette and VGA video controller on system board.
- Socket for Intel 80287 math coprocessor.
- One 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports (integrated on system board).
- 3 full-sized 16-bit AT expansion slots available.

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40 MB VGA Monochrome System	$2,999
40 MB VGA Color Plus System	$3,299
100 MB VGA Monochrome System	$3,599
100 MB VGA Color Plus System	$3,899

Prices listed reflect 1 MB of RAM. External 5.25" 1.2 MB diskette drive available.

THE NEW DELL SYSTEM® 210
12.5 MHz 286.

The price says this is an entry-level system. The performance says it's a lot more.

STANDARD FEATURES:

- Intel 80286 microprocessor running at 12.5 MHz.
- Choice of 512 KB, 640 KB††, 1 MB, or 2 MB of RAM expandable to 16 MB (6 MB on system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 1 MB.
- Integrated diskette and high performance 16-bit VGA video controller on system board.
- Socket for Intel 80287 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 3 full-sized 16-bit AT expansion slots available.

***Lease for as low as $64/month.*
△ Extended Service Plan pricing starts at $190.

20 MB VGA Monochrome System	$1,699
20 MB VGA Color Plus System	$1,999
40 MB VGA Monochrome System	$1,899
40 MB VGA Color Plus System	$2,199

Prices listed reflect 512 KB of RAM.
††640 KB versions of the above systems are available for an additional $80.
100 MB hard drive configurations also available.

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THE DELL SYSTEM® 325 25 MHz 386.

When you need a truly high-performance 386 computer, this is it.

STANDARD FEATURES:

- Intel 80386 microprocessor running at 25 MHz.
- Choice of 1 MB, 2 MB, or 4 MB of RAM* expandable to 16 MB (using a dedicated high-speed 32-bit memory slot).
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots (6 available).

***Lease for as low as $196/month.*
△ Extended Service Plan pricing starts at $370.

40 MB VGA Monochrome System	$5,399
100 MB VGA Color Plus System	$6,299
100 MB Super VGA Color System (800x600)	$6,399
150 MB Super VGA Color System (800x600)	$6,899

Prices listed reflect 1 MB of RAM. 322 MB hard drive configurations also available.

All systems are photographed with optional extras.

AD CODE NO. 11DK9

Technically speaking, the Dell System® 325 is one of the most advanced 386™ computers available. And, according to PC Magazine, it's one of the most advanced 386 computers they've ever tested.

In benchmark after benchmark, the 25 MHz Dell System 325 ran circles around a field of 386-based systems. A field that included the Compaq^ 386/25.

A show of prowess that earned the System 325 PC Magazine's Editor's Choice award.

It was a goal we set for ourselves from the very beginning. And an objective anyone with a penchant for power and performance can appreciate.

THE FIRST PERSONAL COMPUTER THAT'S REALLY PERSONAL.

Of the more than 150,000 personal computers we've sold to date, each one has been individually configured to fit the needs of its owner.

The System 325 takes that idea to its logical extreme.

For example, it runs either MS-DOS,® MS®-OS/2, or our own Dell UNIX® System V. Which is compatible with AT&T's System V Interface Definition. And the world of XENIX® applications.

If speed is of the essence, we can include an optional Intel® 80387 or WEITEK 3167 math coprocessor. And since nothing about this system is lightweight, the standard mass storage is a 100 MB hard disk drive. Or we can configure it with a 40, 150 or 322 MB hard drive.

As you might expect, the output is just as intense. You can choose between VGA Monochrome with

THE DELL 386 SYSTEM 325 HAS A 25 MHz CLOCK RATE, CACHE MEMORY CONTROLLER, IDE OR ESDI HARD DISK DRIVE, PAGE MODE INTERLEAVED MEMORY, AND 100% COMPATIBILITY WITH MS-DOS, OS/2 AND UNIX SYSTEM V.

paper-white screen, VGA Color Plus, or Super VGA for high resolution colors displayed on a larger screen.

Even though the 325 gives you all this performance, it still leaves you six open slots for whatever else you might want to add.

And once you've told us what you want, we'll make sure what you want works—by burning-in the entire system unit.

COMPUTER RETAILERS ARE NO KNOWS.

There are some good reasons computer retailers won't know much about the System 325.

First, with all the new and increasingly sophisticated systems they have to keep up with on a daily basis, you can hardly expect them to know everything.

Second, because Dell sells direct.

Which means you now have the unique opportunity to talk directly with the people who make them. And ask things like, "What is page mode interleaved memory?" or, "How much SIMM RAM should I add?"

In other words, the kinds of details that are important to people who make computers and people who use them.

So dealing direct not only can save you up to the 35% mark-up, but 100% of the frustration.

WE COME WHEN WE'RE CALLED.

One of the things that very clearly sets Dell systems apart from other computers is not just how they're sold but how they're supported.

Overkill was one description used in a recent PC Week article.

Perhaps.

But then, we think you'll agree, when something goes wrong, you want as much help as possible, right?

BEST OF ALL, YOU WON'T HAVE TO EXPLAIN TO A COMPUTER RETAILER WHAT ALL THAT MEANS.

Which is why every Dell system comes with a toll-free technical support line and self-diagnostic software. We're able to solve 90% of all problems right over the phone. The other 10% receive next-day, deskside service. Thanks to our new alliance with Xerox Corporation.

And you get all this help for a full year—whenever you need it—at no extra charge.△

As you've probably guessed, one of the things that drives us most is customer satisfaction.

So we'd like to give you the ultimate guarantee:

Try a System 325 in your office for a month. Run your toughest applications. Put it through its paces, at your pace. If you're not completely satisfied, send it back anytime within 30 days. And we'll refund your money.

No questions asked.

MAYBE YOU SHOULDN'T BUY ONE AFTER ALL.

No matter how many reasons we give you to buy a Dell system, sometimes it makes more sense to lease one instead.

Whether you need a single computer, or an entire office full, there is a leasing plan for your business that is just like 100% financing.

And just as we can custom configure your computers, we can see to it you get a custom designed lease plan to fit your exact business needs.† A fact that has not gone unnoticed. Especially by the Fortune 500. Over half of whom now own or lease Dell systems.

And just as we welcome their business, we welcome your business, too.

Just call us, toll-free. And don't be afraid to ask us the tough questions.

That's the part we like best.

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PC WORLD

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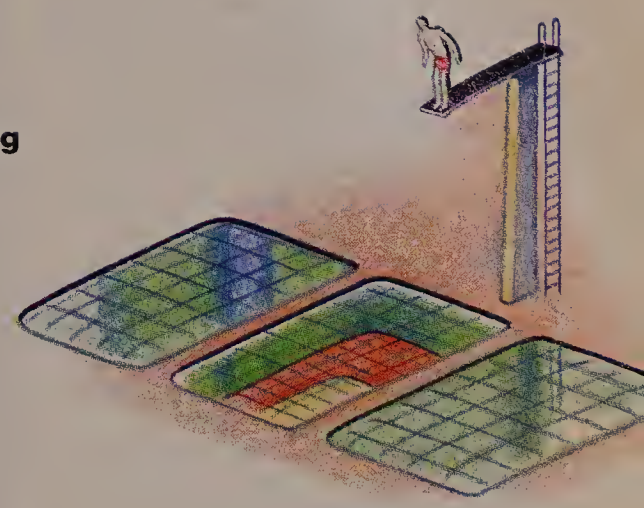

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Intense color and impassioned brushstrokes are the trademarks of paintings created by Vincent Van Gogh.

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Academic Distinctions

CHRIS SEWARD

Contributing Editor Richard Scoville

Contributing Editor Richard Scoville started out as an educator. With a masters in education, a doctorate in developmental psychology, and a university professorship, Scoville was well on his way to a comfortable career in academe.

Until 1982, that is. With funds from a research grant, Scoville bought an IBM PC with 64K, two floppy drives, and a copy of Macro Assembler and BASIC. "When I regained consciousness it was two days later, and I had written dozens of programs, including one to tie into the university's mainframe. Gradually I stopped doing anything academic and concentrated on the PC."

Scoville soon found a way to marry the two interests, however, joining Office Works, a Durham, North Carolina-based PC training outfit. (At press time, Scoville was preparing to launch his own training company, Ergo Training, in nearby Research Triangle Park.) He's still teaching; now, however, the students and the course work are all business.

With six years of experience helping businesspeople master the arcana of *1-2-3* and its competitors, Scoville was a natural to review the three power spreadsheets—*1-2-3* release 3, *Excel*, and *SuperCalc5*. (He also contributed this month's how-to feature, "Exploring 1-2-3's Third Dimension.")

Release 3 marks the end of an era, Scoville says. "The reason *1-2-3* was so popular is that for the first time you didn't have to change the problem in order to solve it. The worksheet model was a simple analogue of a familiar piece of paper, and you could just sit down and get to work. Now it's getting complicated. With these vastly more powerful programs, people have to go back down that road—to restructure the problem, to do some computer programming."

1-2-3 has added muscular data base features, and *Excel* has teamed up with a powerful data base front end, *Q+E*. That's not surprising, Scoville says, since most of what businesspeople do with spreadsheets involves data bases. "That's why the notion of server-based SQL data bases is so attractive. Data bases will be truly accessible when anyone can pull out data through a familiar program, the spreadsheet."

Scoville found a lot to like in two of the three spreadsheets. "*1-2-3*'s 3-D is an absolutely consistent, logical extension of the two-dimensional worksheet, and my fingers adjusted to the new commands in no time. But *Excel* is a dynamite product. And the tide of history is clearly on the side of the graphical user interface." ●

Ed Bott

Ed Bott
Managing Editor

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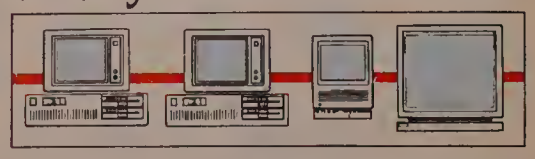

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LaserJet IIP Appears

Downsized Laser Printer Will Sell for Under $1000 on the Street

Hewlett-Packard will steal a march on the competition on September 17 by introducing a downsized, down-priced laser printer designed for personal use. Two-thirds the size and half the weight of HP's LaserJet Series II, the LaserJet IIP supports the same 300-dpi resolution and HP Printer Command Language, but it prints at 4, not 8, pages per minute. It includes one font cartridge slot instead of two and an input tray that holds 50 sheets rather than 200. But that tray holds letter, legal, and A4 paper sizes as well as four sizes of envelopes at once. For another $195 a 250-sheet input tray attaches to the bottom of the printer. The IIP ships with 512K of memory expandable to 4.5MB in two slots rather than one and 14 internal fonts rather than 6. Its single-component toner cartridge is capable of 3500 pages, 500 less than the Series II, but it's slightly cheaper on a per-page basis. Moreover, the IIP's $1495 price tag is $1200 below that of the Series II, and HP expects it to sell for under $1000 on the street. Dataquest associate director John Boldt points out that the IIP's price/performance represents a preemptive strike against competitors who are readying 4-to-6-ppm printers.

Neural Chip Produced

Speeds the Creation of Hardware That Mimics Human Pattern Recognition

During September, Intel and the U.S. Naval Weapons Center will put into operation the first large-scale modifiable circuit for neural computers—*analog* machines whose operation resembles human pattern recognition. Capable of 4 billion operations per second, the chip makes possible the creation of true parallel processors several orders of magnitude faster than current neural nets, which simulate parallel processing on very fast conventional serial computers. While shipments are currently limited to the Navy, Intel marketing manager Bruce McCormick reports that his firm will add the components and development tools necessary for commercial applications such as product quality control or loan analysis. Pricing and delivery decisions are at least a year away, says McCormick, who maintains that "this is pure parallel computing. It executes the theory of neural nets completely." However, competitor Robert Hecht-Nielsen of Hecht-Nielsen Neurocomputer belittles the Intel design as limited in application and expensive. He claims that his company will beat Intel to market with two more-powerful chips designed in conjunction with the U.S. Army. "The Intel chip is useless for business applications," alleges Hecht-Nielsen. The new chips' analog "neurons" work in concert with one another, performing activities for which digital computers are inappropriate. Without taking potential breakthroughs like these neural chips into account, market research firm Schwartz Associates estimates that the neural net market will grow from $65 million this year to $365 million by 1993.

PM Plods On

Presentation Manager Gains Few Applications by Its First Birthday

Last Halloween, as IBM and Microsoft proudly announced the shipment of OS/2 Presentation Manager, 16 software houses endorsed the operating environment. But only half of these will celebrate PM's first anniversary by shipping product. Among the missing: Ashton-Tate, Computer Associates, Microrim, Software Publishing, and WordPerfect. A few prominent programs—Microsoft's *Excel*, Aldus's *PageMaker*, Lotus's *Notes*, and IBM's *OfficeVision*—should make it just under the wire, but most are still cooking. The major holdup has been the sheer complexity of PM, comments Judith Hurwitz of Patricia Seybold's Office Computing Group. Then, too, "everybody's had to develop their own tools," notes Digital Information Group president Maureen Fleming. Furthermore, Microsoft has not yet shipped the crucial PostScript and LaserJet printer drivers. (The PostScript driver should arrive in September, along with OS/2 1.2, but LaserJet support may lag even more.) Then there's PM sticker shock from the massive memory demands, which led many developers to refocus on DOS. "They're being pulled both ways—doing a two-step between OS/2 and DOS/*Windows*," remarks International Data Corporation analyst Nancy McSharry, who expects OS/2 to wrest only 12 percent of market share from DOS by 1992. "It's pretty clear that OS/2 is not the heir apparent to DOS," adds Hurwitz. "Several operating systems will be important in that space."

Quattro 2.0 Debuts

Beefed-Up Spreadsheet Offers Innovative Technology, but Too Late to Damage 1-2-3

Borland International has introduced a revamp of *Quattro* that gets high marks for technology, but analysts doubt it will steal significant market share from Lotus's *1-2-3*. Boasting an innovative scheme of object-oriented programming and dynamic code-swapping, *Quattro Professional 2.0* will run in as little as 512K. It will let users keep up to 32 worksheets open in memory and supports linking and consolidation. Available in the fourth quarter, *Quattro Professional* will also incorporate extensive publishing options and presentation-quality graphic features. The $495 *Quattro Professional* will target corporate users, while *Quattro 1.0*'s $247.95 list price will be slashed in half for price-sensitive users, bringing street prices below $100. Vice President Rob Dickerson says that Borland hopes to gain a 20 percent market share, mostly from *1-2-3*, but that *Quattro* would be hugely profitable if it could double its share to 10 percent. Analysts say *Quattro* may win a few battles but that the war is lost. Neither *Quattro 1.0* nor *Excel* made much of a dent in *1-2-3*'s more than 51 percent market share during the two years that Lotus struggled to ship releases 2.2 and 3. *Excel* garnered only about 10 market points, notes IDC's Nancy McSharry, adding that corporate aversion to changing standards undercuts price and features advantages.

DeskMate Ranks Grow

Tandy's Graphic Environment Gathers Applications Faster Than More Powerful Competitors

While *Windows* and OS/2 Presentation Manager applications dribble out, Tandy continues to gather adherents to its less powerful graphic environment. Lotus and Symantec, which haven't delivered *Windows* or Presentation Manager packages, have announced products for the environment. Scheduled for the fourth quarter, *Lotus Spreadsheet for DeskMate* is a $219.95 version of *1-2-3* release 2.01 (minus macros, add-in capability, and expanded memory support). A $149.95 version of Symantec's *Q&A Write* ships in September. The 23 programs that have appeared since Tandy licensed *DeskMate* in March 1988 include popular titles such as Software Publishing's *First Publisher*, Intuit's *Quicken*, and Dac Software's *DacEasy Accounting*. Lotus is attracted by the million-plus copies of *DeskMate* in the hands of home-office and small-business users, among the industry's fastest-growing segments, says President Jim Manzi. Tandy's blitz of TV and print ads and 7000-store retail chain are other inducements. Lotus executives add that *Windows* development has been slowed by rumors of a major upgrade this fall. By contrast, Tandy quietly tunes *DeskMate*, improving its context-sensitive help and *Windows*-like look and feel. Tandy vice president Howard Elias promises enhancements such as a cross-application macro facility. But *DeskMate*, which has task-switching rather than multitasking, will still target PCs with 640K.

NEC Challenges IBM

Acceptance of Expensive Monitors Hinges on Acceptance of PM

NEC Home Electronics has added two MultiSync monitors and a graphics adapter that challenge the high-resolution standards set by IBM's 16-inch 8514 monitor and 8514/A adapter. Aimed at windowing and CAD users, NEC's MultiSync 4D and 5D offer the 1024-by-768 resolution of IBM's monitor but add a noninterlaced mode and 8514-style interlacing—a cost-saving technique abandoned by most monitor makers in the interest of image quality. NEC's 16-inch 4D costs $250 more than the $1550 8514; NEC's 19-inch MultiSync 5D is $3699. Additionally, the MultiSync Graphics Engine (MGE) board is incompatible with IBM's 8514/A graphics adapter because it exploits Texas Instruments' TMS34010 graphics coprocessor architecture. But most board manufacturers are simply cloning the 8514/A instead, says Mike Tyler, Dataquest's director of graphics services, because software vendors prefer to boost performance by writing directly to the hardware. The MGE includes *AutoCAD* drivers and relies on OS/2 PM's Graphics Program Interface for window users. PM applications are sparse, so NEC added VGA and Super-VGA modes as well. But this pushes the board's price to $1499—twice that of upcoming 8514/A clones, says Greg Reznick, a vice president at rival Headland Technology. "Things aren't straightforward right now," counters NEC director of marketing Jim Schwabe, "which is a good argument for a multiple-frequency monitor." ●

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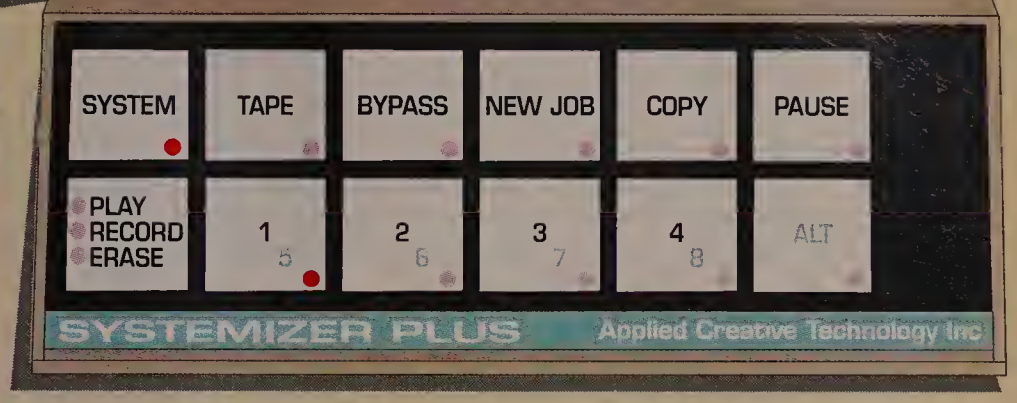

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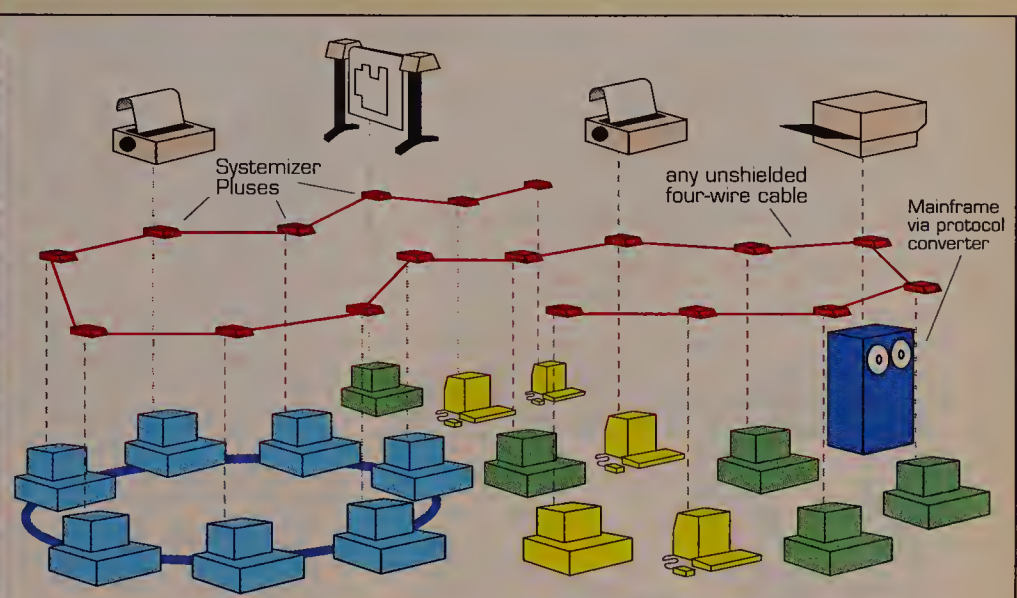

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CREDITS: Gerard's designs, both traditional and electronic, have graced publications from *Personal Computing* to *Business Week.*

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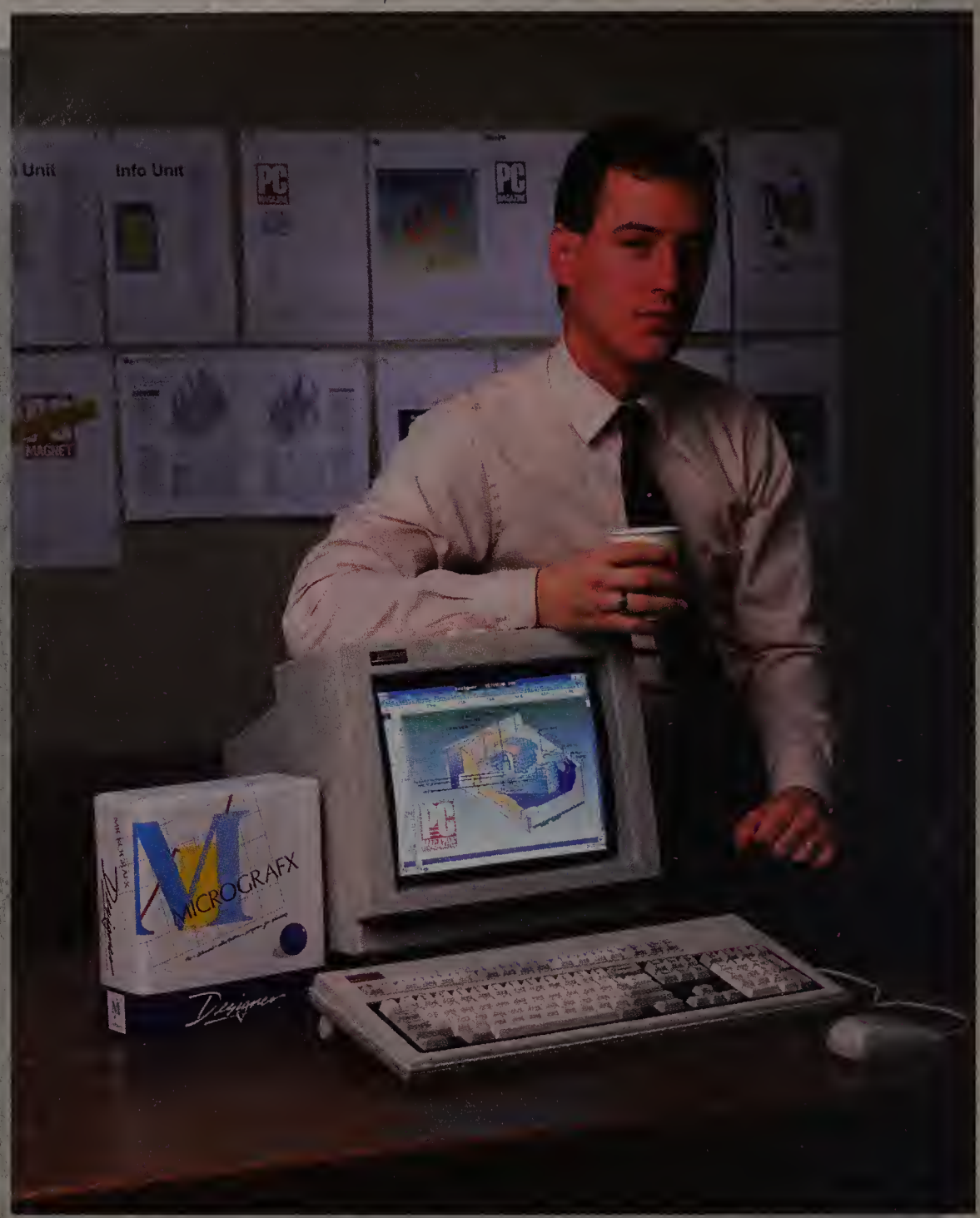

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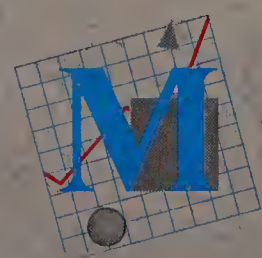

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Richard Landry

How BASIC Is It?

Twenty-five years after its birth, BASIC is being touted as the macro language of the future.

Is that good news for PC users—or bad?

Recently Microsoft celebrated BASIC's 25th anniversary, using the opportunity to say how important it thinks the programming language is to the future of personal computing. That view fits well into Microsoft's scheme of things (since the company practically owns BASIC), but it's hard to take seriously. After all, BASIC is about ten years older than the oldest personal computer, and PC software is supposed to be entering an era in which smart applications make programming obsolete. What gives?

Self-interest aside, Microsoft is simply underscoring a trend that will grow more apparent as applications written for OS/2's Presentation Manager arrive from the major software vendors. Each of the top players—Ashton-Tate, Borland, Lotus, and Microsoft—plans to offer a family of next-generation applications that hook into each other, letting users form powerful, custom solutions. But we're not talking about programming as we know it today. BASIC and other high-level languages are set to emerge at the heart of these new applications, but not until they undergo a transformation that renders them unrecognizable from their former selves.

If you want a good example of where a language like BASIC can go, take a look at Microsoft's *Excel*. *Excel*'s macro language is a version of BASIC customized to handle spreadsheet functions. But it also enables you to modify menus, build dialog boxes, and create other advanced procedures via a combination of macro recorder, pulldown menu selections, and some macro editing. Even the integrated macro debugger that comes with the program is just an *Excel* macro.

You can expect all of Microsoft's forthcoming *Windows* and Presentation Manager products to include an application-specific version of the BASIC macro language. And don't be surprised if *Windows* and Presentation Manager take on BASIC as an environment-wide language that lets you create customized solutions using separate applications as building blocks.

But BASIC isn't the only game in town. *Excel* has plenty of company on the spreadsheet front with Informix's *Wingz for OS/2*, a spreadsheet built using the program's own robust macro language (see "Power Spreadsheets: A New Standard?" in this issue). And Ashton-Tate is following a strategy that puts the dBASE language at the hub of its next family of products. Although mum on specific product ship dates, A-T is expected to release Presentation Manager versions of its *FullWrite* word processor, *Full Impact* spreadsheet, and, of course, *dBASE* data manager sometime in 1990. You should be able to integrate all these programs directly through dBASE commands and through menu and dialog-box selections. Finally, there's *1-2-3/G*, which is bound to extend release 3's macro programming facility to provide powerful data management features.

So there's really nothing special about BASIC, except that people are more familiar with it than any other PC language. While that means Microsoft might hold an initial advantage, it won't gain anything over the long run by expecting all users to become conversant in a command language. For a while, power users may also find they have more precise control over an application by typing in a command string than by selecting options from a dialog box.

(continues)

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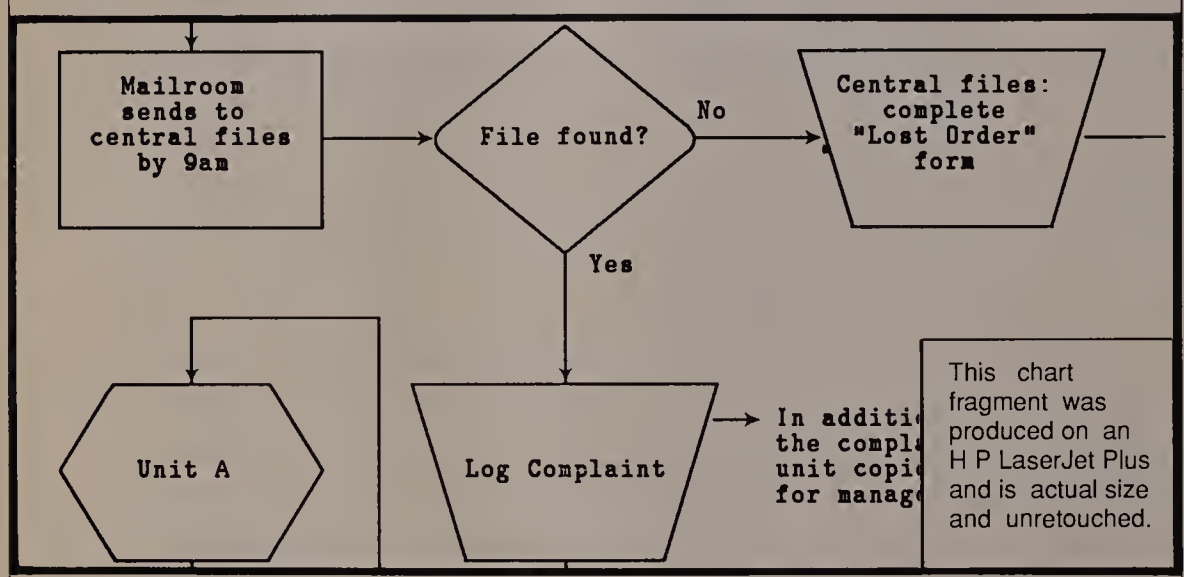

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But the benchmark for future programs will be how little they force you to write or edit code.

In one sense, this new world of application building blocks is a throwback to the early days of personal computing, when the only packaged software around was Microsoft's BASIC compiler for the MITS Altair, and hackers had to code their own solutions. But here's the difference: Tomorrow's application building blocks will try to avoid any compromise between the convenience of packaged software and the freedom of programming languages. In this respect, they may finally bury the question that's been around as long as PCs themselves: Do you want tools or solutions? The gurus of tomorrow's software say you can have both.

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St., San Francisco, CA 94107; fax 415/442-1891; MCI Mail Richard Landry/301-3685. ●

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Next in

PC WORLD

November

Polished Presentations

When it comes to convincing others that your solution is the right one, nothing makes the point like a sharp, clearly focused chart or graph. We review seven top business graphics programs that promise to turn humdrum handouts into action items.

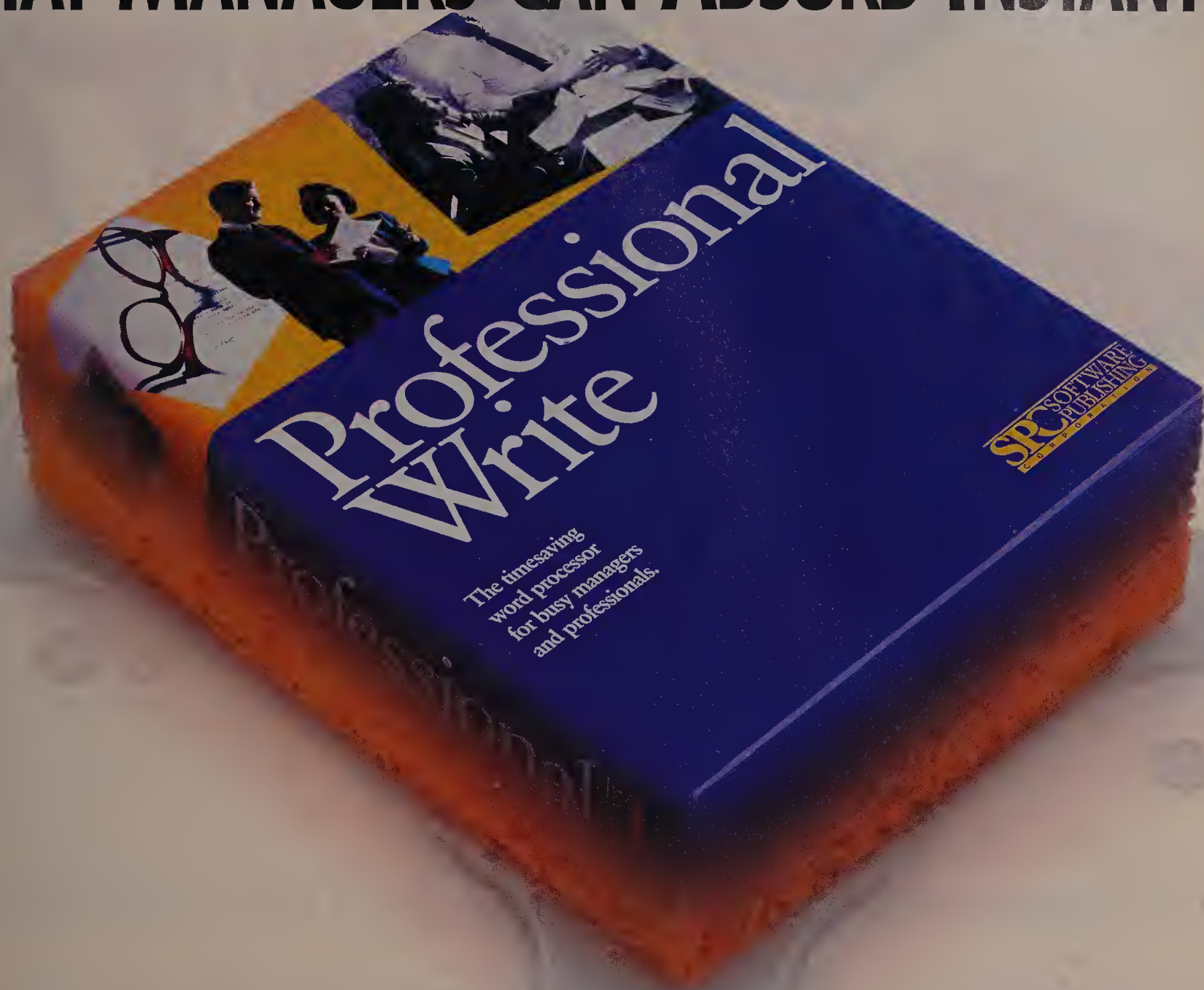
Attention-Getting Documents

Want to put some sizzle in your reports and newsletters—without turning into a full-time desktop publisher? Four packages priced under $200 fill the gap between full-featured word processing packages and professional desktop publishing tools.

The Wider World of Windows

Our quarterly Special Report previews and reviews important new *Windows* software and emerging video standards. Will bigger, sharper displays help Presentation Manager take off? And can OS/2 users afford one more expensive upgrade?

WORD PROCESSING SOFTWARE THAT MANAGERS CAN ABSORB INSTANTLY.



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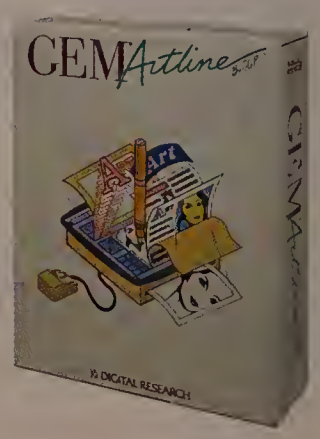

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LETTERS

Reactions and responses from the PC World community

Rose-Colored Windows

Stewart Alsop and I must be looking at the world through different windows. In his June 1989 *Windows Journal*, he waxes eloquent about *Windows* becoming a viable user interface. Either he has a more current release than I have, or he's a heck of a lot more tolerant.

Let's be honest about *Windows*. For the novice, it's difficult. Help screens are almost nonexistent. If you're experienced, you can find an executable file or a data file you can run from a directory screen. But how does the novice know?

The answer is, no doubt, to read the documentation and do things by the book. That's just my point: *Windows* should be easy and natural to use. I'll continue to dabble with it, but I'm not going to bog down my work by trying to use it for production. Mr. Alsop, to his credit, is willing to take the plunge, but I caution all within earshot: *Windows* in its present state is only for the hardy.

Randolph Cabell
Bluemont, Virginia

ANTHONY RUSSO

An Unfair Accounting?

Your review of multiuser accounting software ["Net Gains in Multiuser Accounting," *PCW*, July 1989] contained a number of errors and simply does not reflect the experience of over 100,000 satisfied *SBT* users.

Most *SBT* users follow our recommendation and run the program in compiled form under *Foxbase Plus* or *Clipper*. Running the program under *dBASE IV* placed *SBT* in the poorest possible environment to evaluate usability and performance.

The review comments that menus and input screens are "not as intuitive...and most main menu options lead directly to input screens." At main menus, users may enter transactions immediately, without having to navigate through multiple submenus. For less frequently accessed choices, they are provided multilevel menu systems. It is difficult to see why this is a disadvantage.

Contrary to the criticism in the review, lookup windows are available under both *Foxbase* and *Clipper*. As for your criticism of *SBT*'s audit trail, our users report that the audit trail satisfies their professional demands.

For a review to be useful, its conclusions must be derived from application of definitive test criteria to a representative user environment. In our opinion, this review failed to do so.

Walter L. Good
Vice President of Corporate Marketing
SBT Corporation
Sausalito, California

Running SBT Series Six Plus *under* Foxbase *or* Clipper *does indeed improve performance, a fact we noted in our review; it also provides lookup windows, a fact we omitted. We chose to evaluate the product under* dBASE *because it is by far the most widely used data base management system among our readers. In any event, performance was not a factor in our final evaluation and was not included in our Executive Summary. Our review also omitted mention of* SBT's *vertical applications catalog, which lists third-party products. Finally, the product name was styled incorrectly in our review; SBT calls it* Series Six Plus *version 6.2.* PC World *regrets the omissions. —Ed.*

As a partner in a consulting firm specializing in multiuser accounting packages, I have had hands-on experience with all the programs you reviewed ["Net Gains in Multiuser Accounting," *PCW*, July 1989]. For the most part, Mr. Soucie's comments were right on. However, I disagree with his conclusions about *SBT*'s overall design. Mr. Soucie

(continues)

claims it's less intuitive than the other programs and has only a few submenus. I have found that a program is most intuitive when it has very few submenus, with most main menu headings leading directly to input screens.

SBT does lack a number of features and can be slow, but it stores detailed history as well as the other programs—better than some—and is the easiest to customize. Many of our clients without computer experience get *SBT* up and running easily and efficiently. For a small or medium-size business, *SBT* is a solid accounting solution that's easy to learn and use.

David Faye
Encino, California

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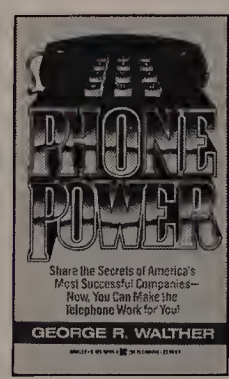

*George Walther, *Phone Power* (New York: Berkley Books, 1986).

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The dBASE Debate Rages

Tony Lima's review ["Data Base Powerhouses Strike a Balance," *PCW,* July 1989] states that you can "write a complex [*dBASE IV*] program simply by designing forms, reports, and labels and then linking them." This is misleading. You cannot write complex programs in the application generator; you *can* string together different types of files. Also, one of *dBASE IV*'s best new features didn't get a mention: .MDX files, the new production indexes, are a great idea that no other data base I know of can equal.

Lang Murphy
Yonkers, New York

Many developers would be surprised at your assessment of *Paradox*'s application generator. It allows users to build complete turnkey applications with full data entry, editing, and reporting capabilities. *Paradox*'s built-in query optimization often results in faster real-world execution than compiled code does. A compiler is simply not necessary for programs that are properly written.

Dan Ehrmann
President, Kallista Inc.
Chicago, Illinois

I can't let the misinformation in your *R:base* review pass unremarked. Tony Lima's assertions that *R:base* lacks QBE [query by example] and maroons its users in an "archaic interface" are untrue. Prompt by example allows

(continues)

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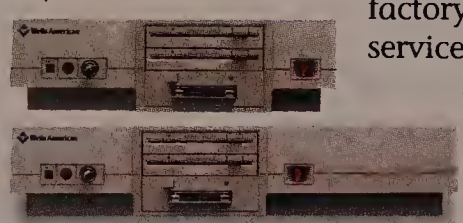

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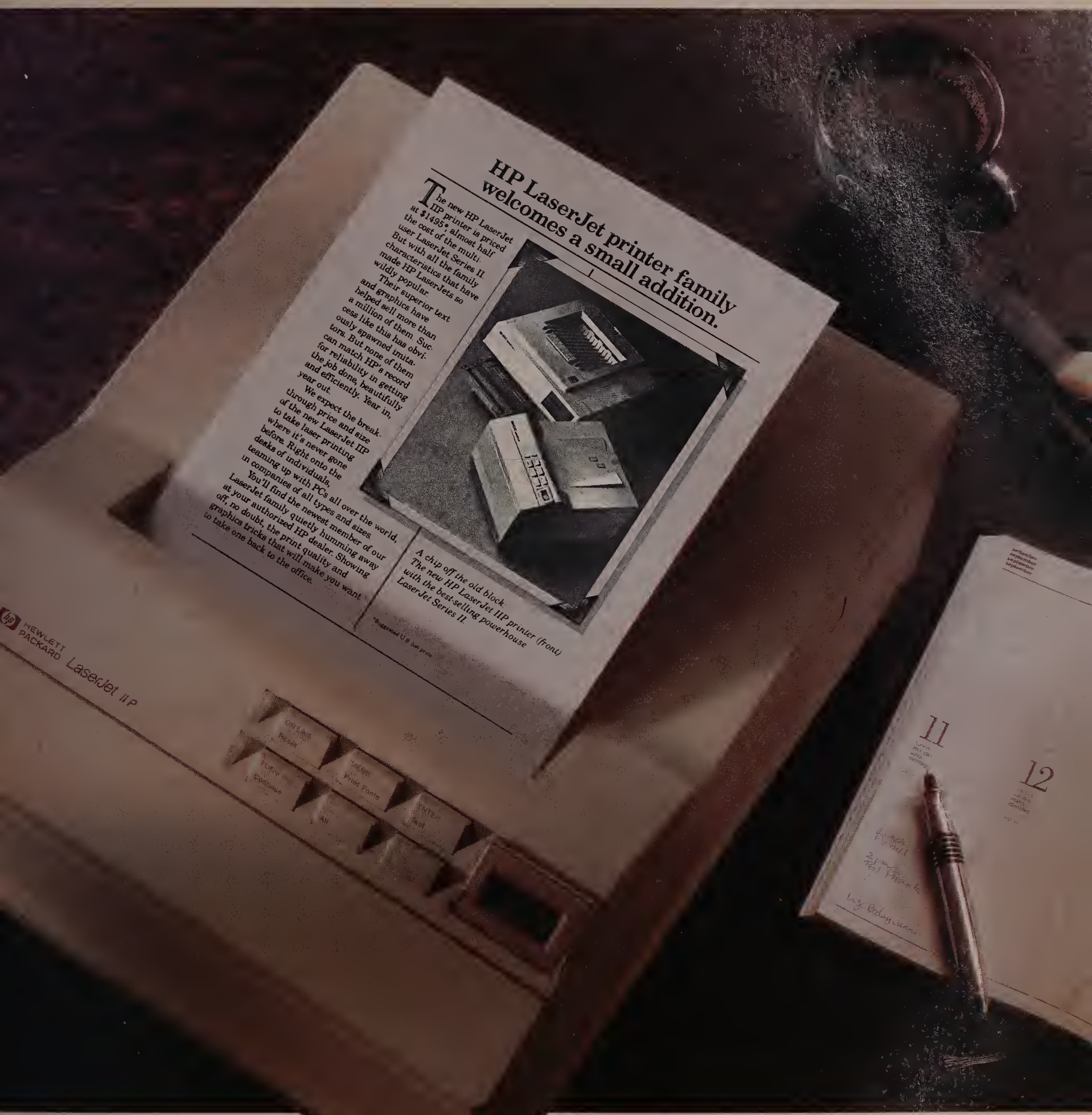
*Suggested U.S. list prices: LaserJet IIP $1495; LaserJet Series II $2695. Dealer prices vary.



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HEWLETT PACKARD

even novices to query data without knowing a word of the *R:base* command language. Another error: "*dBASE IV* is the sole contestant with a pseudocompiler." *R:base* has had one for years. It is my opinion that as a *dBASE* consultant and writer, Mr. Lima has let his interests bias the review.

Harold C. LeBlanc
Eden Prairie, Minnesota

In the interest of publishing authoritative reviews with an eye toward real-world needs, PC World *actively seeks authors such as Tony Lima who use or develop business applications for a living. It's true, as Mr. LeBlanc states, that Mr. Lima is a dBASE developer. But so are most PC data base programmers; one of the main reasons we chose Mr. Lima is because he also has extensive experience writing in Paradox Application Language. We feel that his hands-on expertise as a developer makes him more, not less, qualified to evaluate data management packages. Here are his responses to the points raised in these letters:*

"Mr. Murphy has not considered the way dBASE's QBE can integrate with other objects: screen forms, reports, labels, and applications. I am currently finishing a dBASE application with a total of about 10,000 lines of code. I expect to write no more than 500 lines by hand; dBASE IV *will generate the rest. None of the other products can match that for a development environment.*

"I have found that large Paradox *data tables cannot be optimized, especially on networks.* Paradox's *application generator lets you tie together elements of an application with menus, but it isn't equal to* dBASE IV's *capabilities.* dBASE IV *lets you add code on the fly and choose whether to include the code before or after the current module.*

"R:base *does indeed have a pseudocompiler. My apologies for the error. However, it does not have QBE, at least no version that corresponds to IBM's query management facility standard." —Ed.*

Revised Forms

Your review of forms software ["The Best in Forms Software," *PCW*, July 1989] incorrectly states that *JetForm 1.01* does not support PostScript. When you install the program, you can select PostScript as an option. In addition, *JetForm* supports all of Hewlett-Packard's internal and cartridge fonts, any downloadable fonts, and any LaserJet features, including multiple paper trays, duplexing, and downloaded forms macros.

Barry Gillespie
Director of Marketing
Indigo Software
Ottawa, Ontario, Canada

During the fact-checking process, an Indigo spokesman told PC World *that* JetForm *lacks PostScript support. Nonetheless, because the program does, in fact, support PostScript printers, its Printing score in the Executive Summary should have been rated Good, not Fair. We regret the error. However, given* JetForm's *high price, lack of soft fonts, limited field definition options, and tendency to crash, its Overall Value rating of Fair would not have changed. —Ed.*

POWER TIP NO. 69

When the LaserJet Makes Single Double

If your LaserJet is printing double-spaced text when you're expecting single-spaced output, it may be that your text is too wide. When the LaserJet can't fit a screen line onto paper, it wraps characters down to the next line, creating what looks like double-spaced text. Solution? Try narrower margins.

Ted Nace
Author, LaserJet Unlimited
Berkeley, California

Corrections and Clarifications

The number for ordering Northgate's OmniKey/102 keyboard (*The Upgrade Path, PCW*, September 1989) should have read 800/526-2446.

Our June roundup, "Seven Top LANs: A Hard Look at Ease of Use," omitted some facts about IBM's OS/2 LAN Server. It can run in any OS/2 Extended Edition environment, not just on PS/2 50s or higher models as we stated. In addition to supporting Token-Ring, it supports the IBM PC Network LANs, and version 1.2 supports Ethernet.

To send correspondence, please see How to Contact PC World, *page 4.* ●

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THE HELP SCREEN

PC World offers answers and advice at every level

Remove incorrect additions from your spelling checker, fix documents that display but won't print completely, automate calculation of employee shift schedules, and tell DOS that COMMAND.COM is in the RAM disk.

Karl Koessel

Dispelling Misspellings

Q. *I inadvertently entered some misspelled words into my* WordStar *spelling checker. A friend suggested that* PC World *might tell me how to remove them. Would you explain how to purge my spelling checker?*

John E. Ahlerich
Grand Terrace, California

A. Most PC word processors keep "dictionaries" of user-added spellings in one or more files separate from the program's main dictionary. For example, *WordPerfect 4*.x calls its main dictionary LEX.WP, and spellings added to it are stored in {WP}-LEX.SUP; *WordPerfect 5.0* uses the names WP{WP}US.LEX and WP{WP}US.SUP. (The first release of *5.0* called the main dictionary WP{WP}EN.LEX.) *Word 3*.x's main dictionary file is MAINDICT.CMP and its supplemental dictionary is UPDICT-.CMP; *Word 4.0* and *5.0* use the names SPELL-AM.LEX and UPDAT-AM.CMP.

Early versions of *WordStar* use a spell-checking program called SpellStar. Unlike the programs just mentioned, SpellStar uses a single-file dictionary, SPELSTAR.DCT; misspellings are removed via the program's Maintenance option. In *WordStar 3.3*, the more versatile, multifile CorrectStar replaced SpellStar. CorrectStar's main dictionary is called MAIN.DCT; a smaller file, INTERNAL.DCT, holds the most commonly used words and is kept in RAM to speed spell checking. User-added spellings are stored in a file called PERSONAL.DCT. *WordStar 4.0* uses the same spell-checking system; *5.0*'s CorrectStar differs slightly. Its main dictionary and its supplemental dictionary are still called MAIN-.DCT and PERSONAL.DCT. However, *5.0*'s CorrectStar does not include INTERNAL.DCT. Under *5.5*, they're called SPLMN001.DCT and PERSONAL.DCT.

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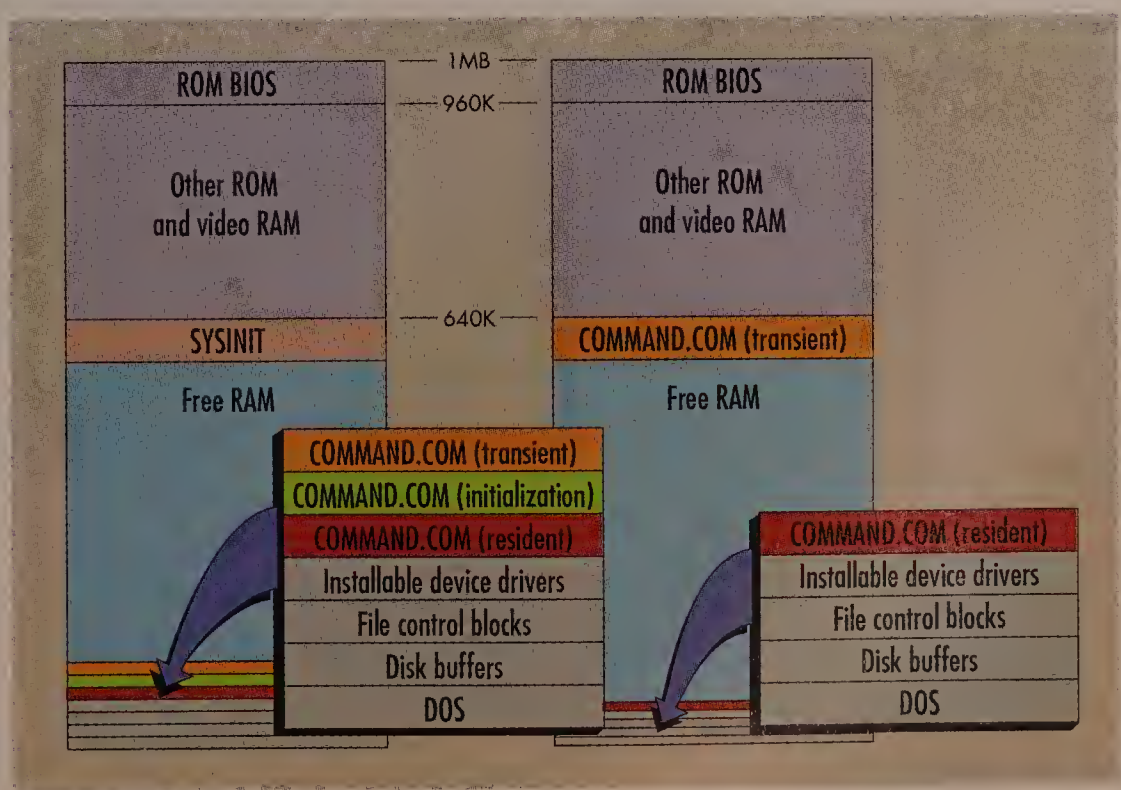

To boot the PC, SYSINIT loads COMMAND.COM at the bottom of RAM (left). COMMAND.COM then moves its transient portion to the top of user RAM and disposes of its initialization code (right). **See page 40.**

ANTHONY RUSSO

These supplemental dictionaries, like those of most word processors, are simple ASCII files. Therefore, to delete entries from *WordStar*'s supplemental dictionary, PERSONAL.DCT, simply bring it into *WordStar* as a nondocument (N) file. With *Word*, one simply loads the .CMP file, deletes unwanted entries, and saves the file unformatted. *WordPerfect* users load and save ASCII text files with Text In/Out (<Ctrl>-<F5>1 and <Ctrl>-<F5>2). One note of caution: Although it's OK to delete words from your supplemental dictionary, don't add words to it while it's loaded as a document. Add words only by using the spelling checker.

Vanishing Text

Q. *I prepare a lot of reports in* Microsoft Word, *using data downloaded from information services as well as text files generated by other programs. In the process I merge a lot of files. Several times now I've encountered documents that won't print completely; partway through, usually at the end of some merged text, the printing just stops. Although I can see the entire document in* Word, *when I use the DOS command TYPE to display the file, it stops at the same place the printer does. I'm back to cutting and pasting to get my reports out. Is there some bug in* Word? *Is my computer getting sick? Do you have any idea what's going on?*

Alistar Bromfeld
Albany, California

A. The culprit is known as the ASCII end-of-file (EOF) marker, or Control Z (ASCII 26). Normally, DOS and most application programs ignore the EOF marker. For text operations, however, the EOF marker signifies the end of the file. For example, since the TYPE command is intended to be used only for viewing the contents of text files, it stops displaying a file at the first ASCII 26. Other operations that might be performed on nontext files (such as COPYing) ignore ASCII 26 (and use the file's size instead) because that byte might be a color attribute, a piece of graphics or font data, or part of a program instruction.

When you merge a file into a *Word* document, all of the incoming file is placed into the document. So if the incoming file ends with (or contains) an EOF marker, it too is added to the document. Unfortunately, *Word*'s Print function stops printing when it encounters an ASCII 26, presuming that it's a valid EOF marker.

While some word processors merge in text up to, but not including, the first EOF marker, many are like *Word* in that they pull in the whole file. (*WordPerfect* is among these, but it has the commendable ability to print the entire file anyway, printing ^Z for the EOF marker). Creating a macro will enable you to remove EOF markers easily from such documents.

Here's how to make such a macro for *Word:* Press **<Shift>-<F3>** (Record Macro). Press **<Esc>R** (Replace). Hold down the **<Alt>** key, type **26** on the numeric keypad, and release the <Alt> key (a small right arrow will appear). Press **<Tab>** twice, then **N<Enter>** (no confirmation). Now, press **<Shift>-<F3>** to stop recording the macro. Type **EOF_remover^**, but don't press <Enter> yet. Then press **<Ctrl>-Z** and **<Enter>** to name the macro. From now on you can remove EOF markers from your *Word* documents simply by pressing <Ctrl>-Z.

Employee Scheduling

Q. *Could you tell me if any PC programs calculate shift schedules? I need a program that can cover a full seven-day week, 24 hours a day, in 8- and 10-hour shifts for a large staff.*

James E. Davidson
Oberlin, Ohio

A. I know of three packages that more or less automate employee scheduling. Essentially, they all produce schedules by matching employee skills, availability, and seniority against department or company jobs and needs. They support several schedule types, including overlap and rotation. All enable you to print individual and group schedules and to see who hasn't been scheduled. I haven't tried any of these packages, so you shouldn't consider their mention a recommendation; you'll have to determine which, if any, meet your specific requirements.

Schedule Master ($995) from Schedule Master Corporation was developed for Kroger, the largest supermarket chain in the United States. A disk-based slide-show–style presentation describing the program and its use, along with sample printed reports, is free. Those who want a closer look at *Schedule Master* can purchase a fully functional "no-save" version with manual for $100. The product includes a step-by-step tutorial. An an-

(continues)

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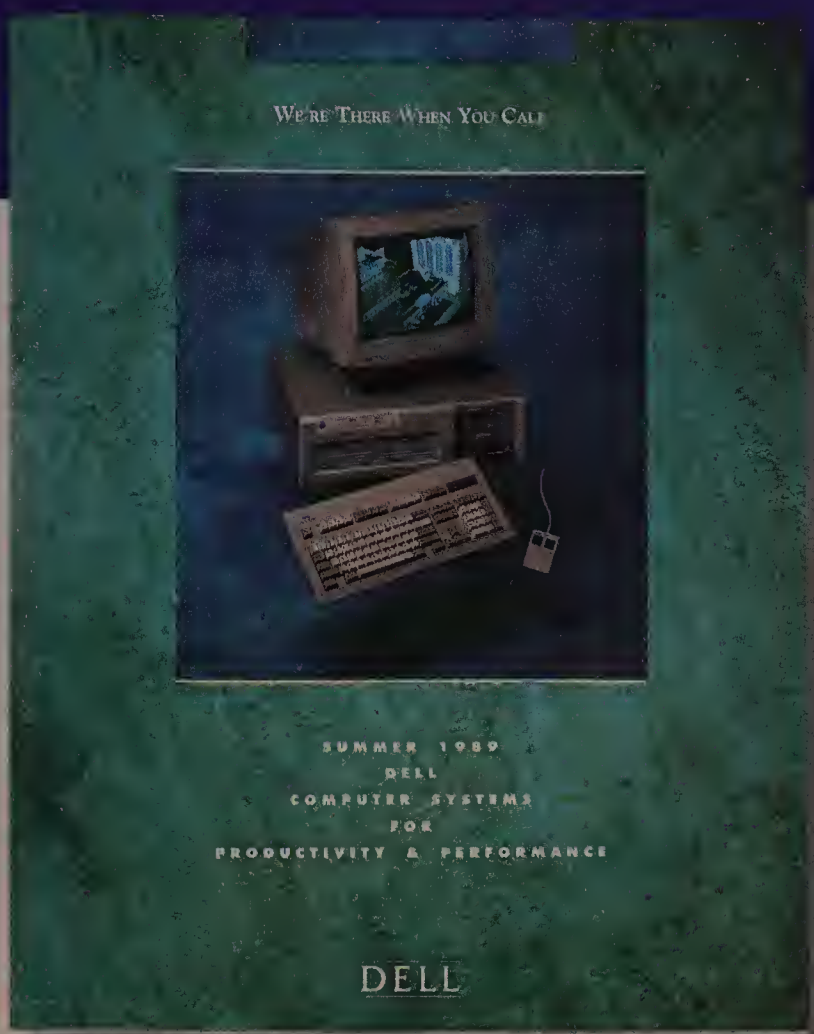

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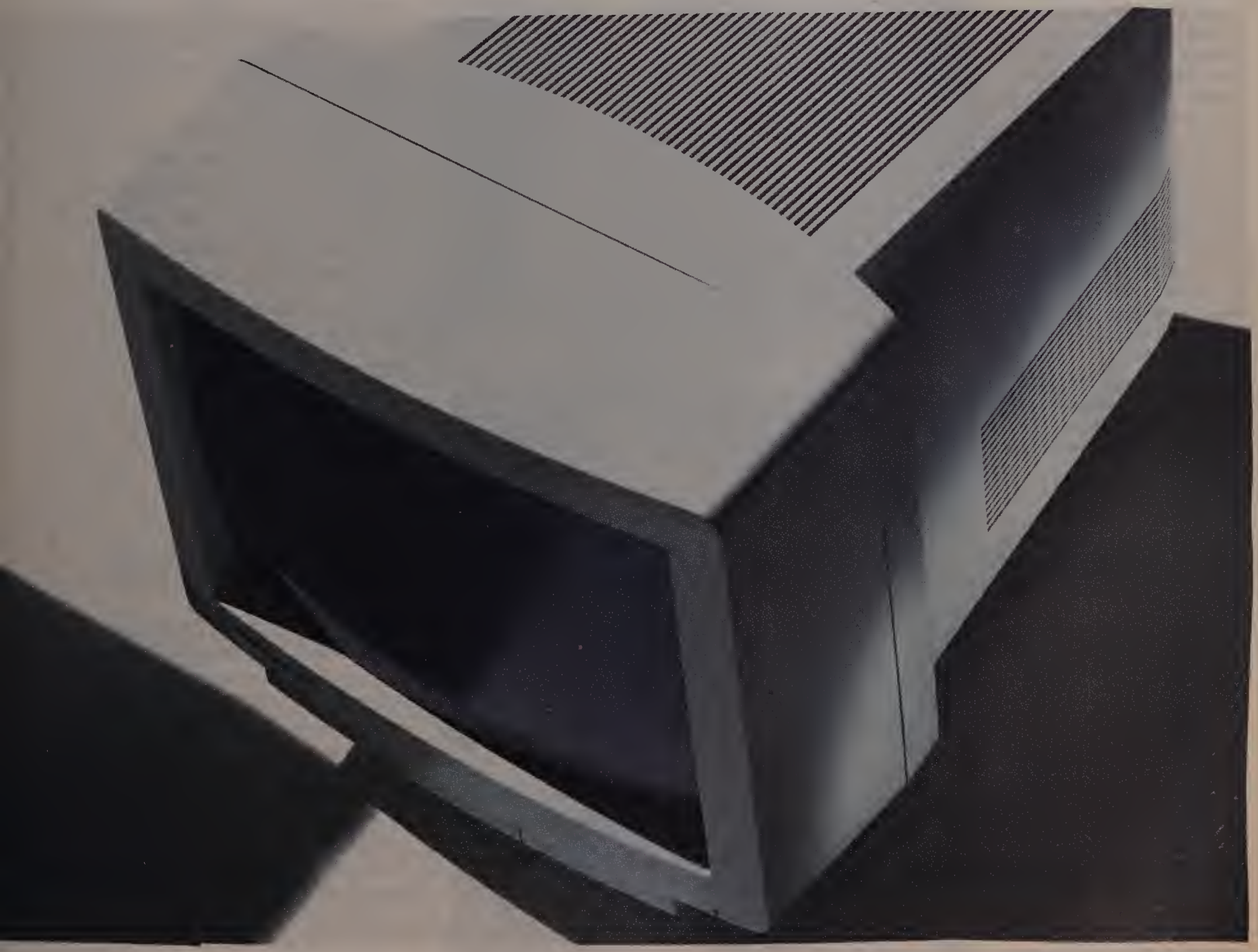

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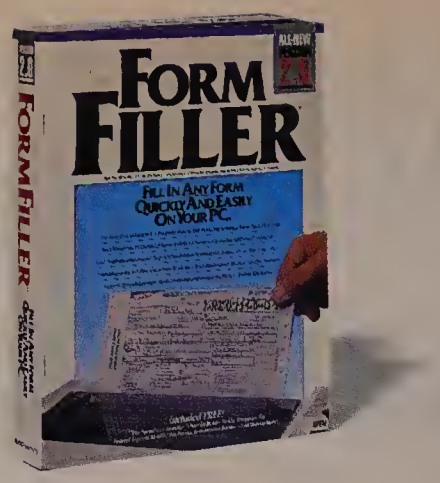

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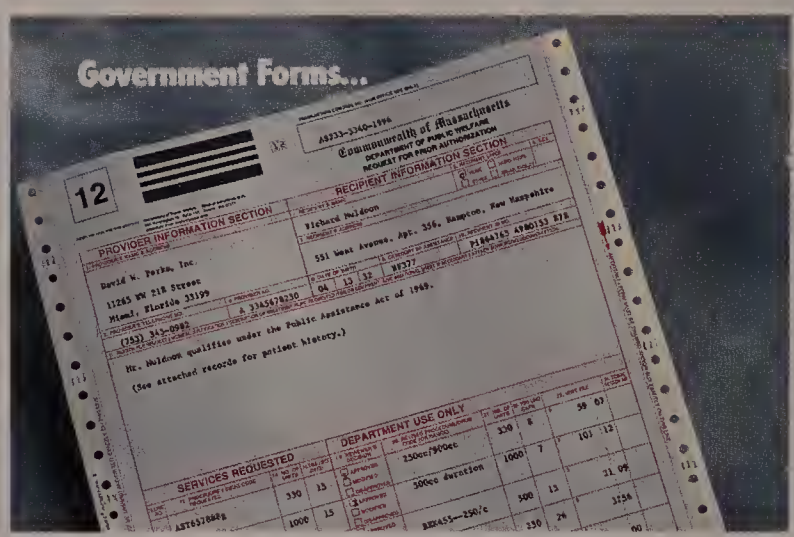
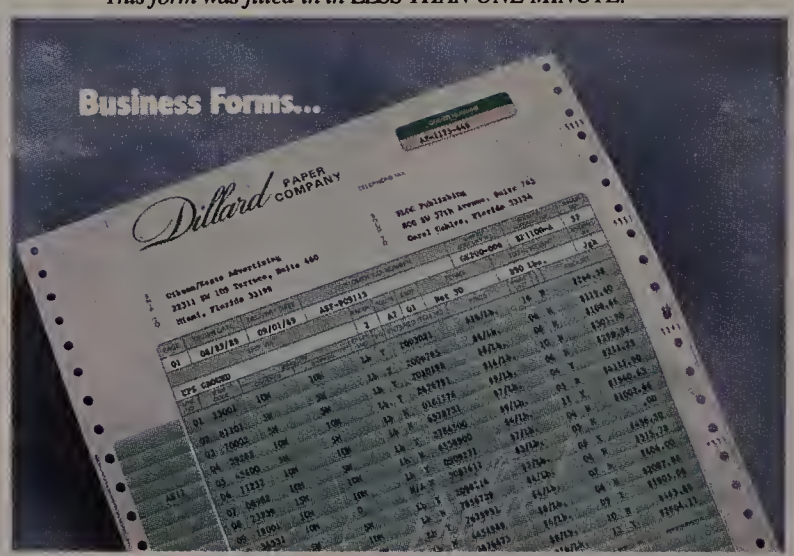
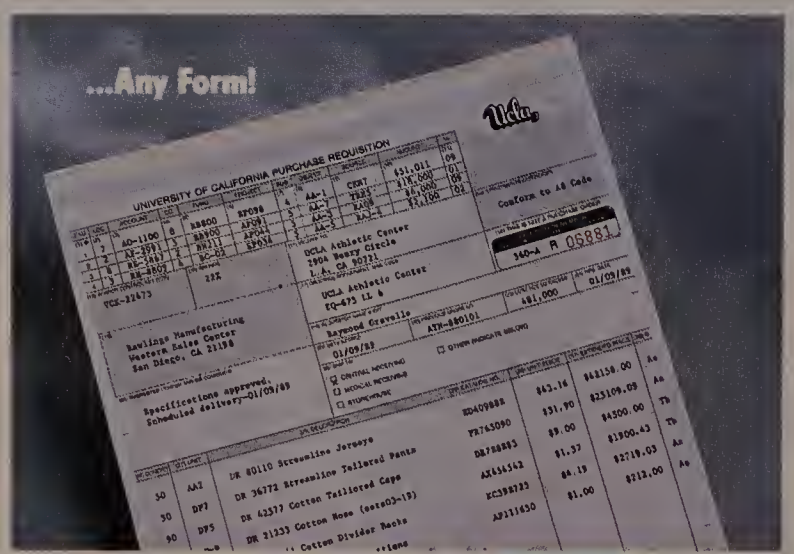


Government forms requiring calculations and repetitive information can be handled easily using FormFiller. This form was filled-in in LESS THAN ONE MINUTE.



This form requires numerous part numbers, shipping and pricing codes, which can be stored in FormFiller's Look-Up table, and automatically inserted into the form.



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Who Works When ($479) is from Newport Systems, which also offers a free disk-based presentation, sample printed reports, and a list of typical questions and answers. For $55 you can get a demo version (fully operational, nine-person limit) with manual.

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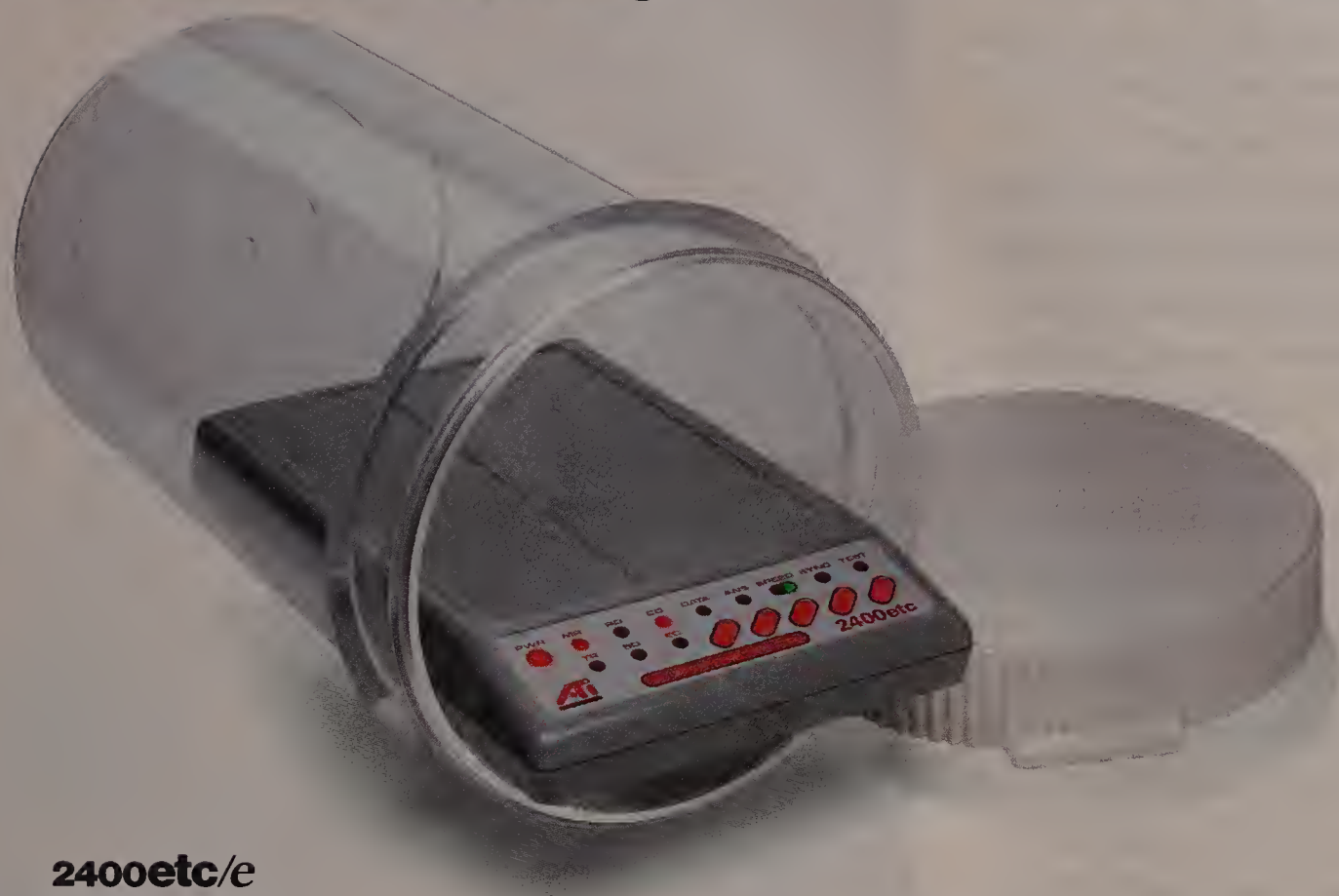

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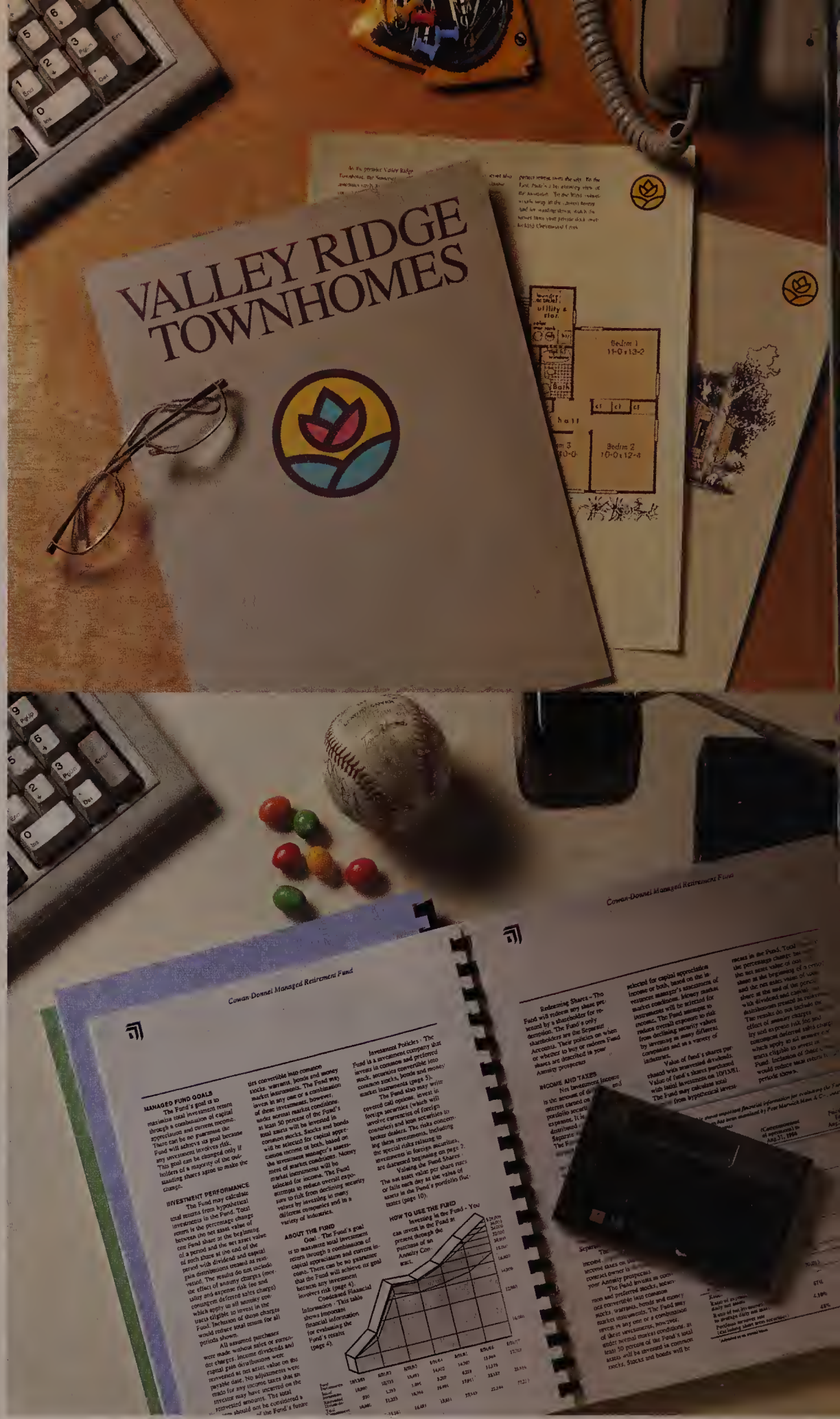

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RAM Drive's COMMAND.COM

Q. *I'm having trouble with the RAM drive (C:) that I use with my dual-floppy XT compatible: I cannot temporarily exit to DOS from within some programs—for instance,* Turbo Basic*—because COMMAND.COM is not on the program disk in drive A:. I've tried copying COMMAND.COM to drive C: and setting PATH=C:\, but that doesn't work—the computer still searches only drive A:. It would be far too time-consuming to copy COMMAND.COM to all my floppies, and not always possible, since some disks are quite full. Is there a way to get my system to look on drive C: for COMMAND.COM?*

Philip Kapusta
Fredericksburg, Pennsylvania

A. COMMAND.COM loads automatically when you start your system. It has three parts: initialization, resident, and transient. The initialization portion stores the resident portion on top of DOS, stores the transient portion as high as possible in DOS's 640K memory range, and destroys itself by processing AUTOEXEC.BAT. The transient portion generates the DOS command prompt and knows how to perform internal commands (like

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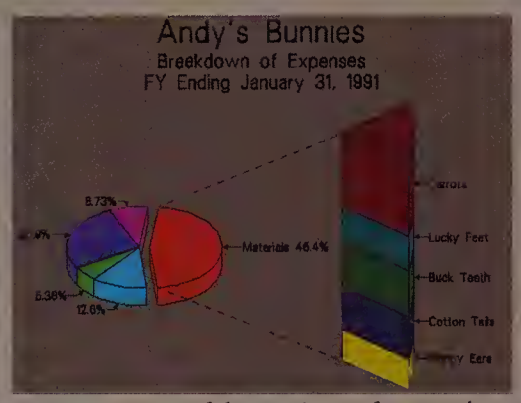

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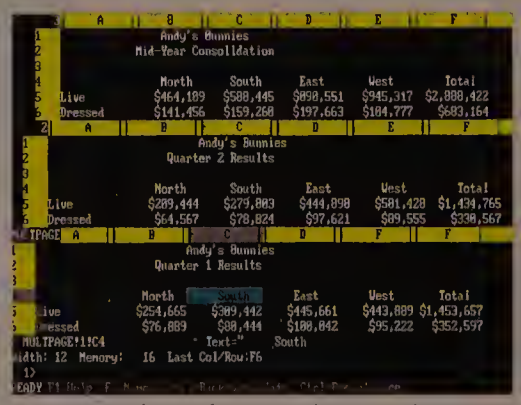

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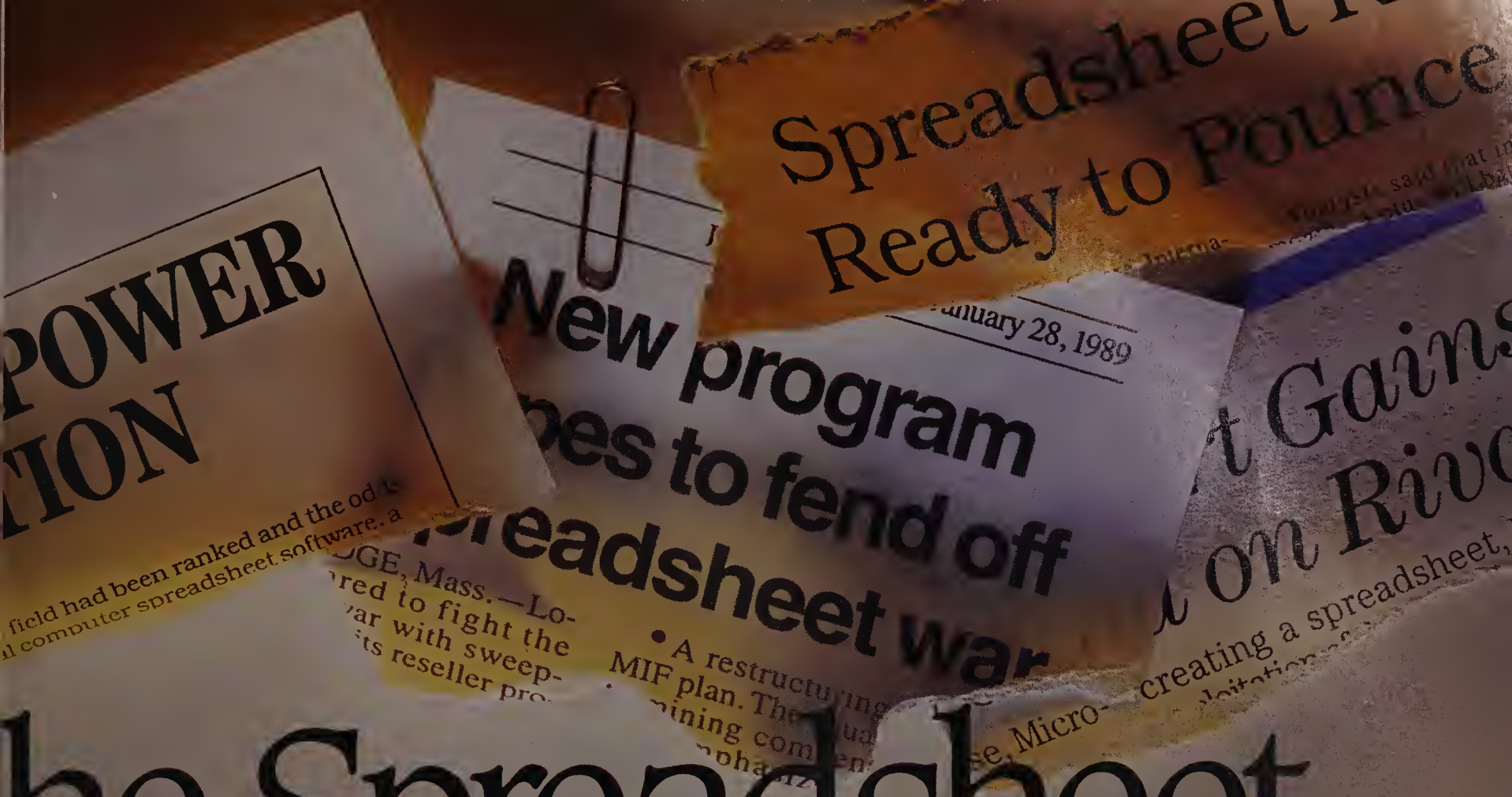
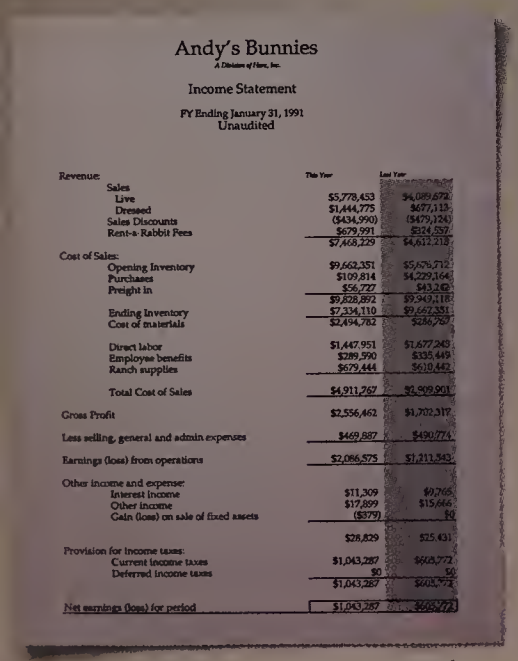


he Spreadsheet portant Update.

to be precise. Linking either in memory or on disk, either pages of the same spreadsheet or independent, either SuperCalc5's files or Lotus® 1-2-3®'s.



Andy's Bunnies
A Division of Hare, Inc.

Income Statement

FY Ending January 31, 1991
Unaudited

	This Year	Last Year
Revenue:		
Sales		
Live	$5,778,453	$4,089,672
Dressed	$1,444,775	$677,113
Sales Discounts	($434,990)	($479,124)
Rent-a-Rabbit Fees	$679,991	$524,557
	$7,468,229	$4,812,218
Cost of Sales:		
Opening Inventory	$9,662,351	$5,676,712
Purchases	$109,814	$4,229,164
Freight in	$56,727	$43,242
	$9,828,892	$9,949,118
Ending Inventory	$7,334,110	$9,662,351
Cost of materials	$2,494,782	$286,767
Direct labor	$1,447,951	$1,677,245
Employee benefits	$289,590	$335,449
Ranch supplies	$679,444	$610,442
Total Cost of Sales	$4,911,767	$2,909,901
Gross Profit	$2,556,462	$1,702,317
Less selling, general and admin expenses	$469,887	$490,774
Earnings (loss) from operations	$2,086,575	$1,211,543
Other income and expense:		
Interest income	$11,309	$9,765
Other income	$17,899	$15,666
Gain (loss) on sale of fixed assets	($379)	$0
	$28,829	$25,431
Provision for income taxes:		
Current income taxes	$1,043,287	$605,772
Deferred income taxes	$0	$0
	$1,043,287	$605,772
Net earnings (loss) for period	$1,043,287	$605,772

Produce annual-report quality output everyday.

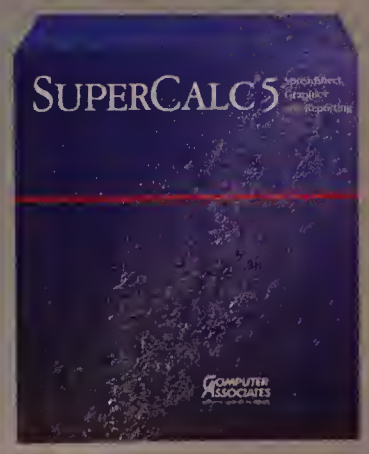
Which brings us to the "L" word. SuperCalc5 not only reads and writes Lotus® 1-2-3® files, it totally coexists with Lotus. Letting you easily move 1-2-3 macros into SuperCalc5 and back again. Even toggling between menus is a snap for SuperCalc5.

But not for Excel.®

Which now brings us to the "E" word. Unlike Excel, SuperCalc5 runs on all IBM® and compatible computers but also takes full advantage of 286 and 386 machines when *you* decide to make that transition.

And if all that isn't enough to make you run out today and join the revolution, there's even more incentive.

Like our free demo disk offer through Dec. 31, 1989. And our $100 upgrade offer for just about any spreadsheet you're using. Call 1-800-531-5236. In Canada call 1-800-663-6904.



Which finally brings us to our admittedly biased outlook for the much touted spreadsheet war.

With SuperCalc5, peace is at hand.

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Software superior by design.

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Circle 246 on reader service card

Definitions on disk

Language Master gives you instant access to more than 80,000 dictionary definitions plus 470,000 synonyms from Merriam-Webster—the English language authority.

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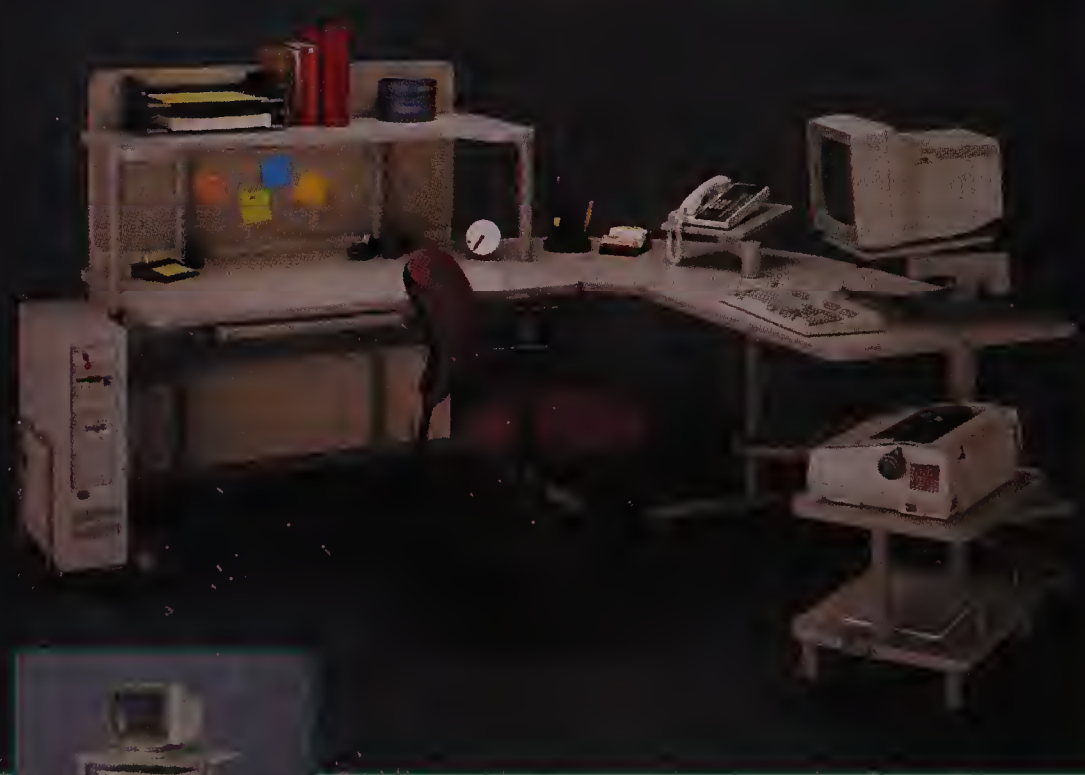

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DIR, COPY, and DEL) as well as how to find and run files. A large executable file may overwrite some or all of the transient portion. The resident portion provides support for terminating a program, then checks to see if the transient portion of COMMAND.COM has been corrupted and restores that portion if necessary.

To fix the transient portion, COMMAND.COM must know where to find the original file (or a copy). So when you boot the computer, DOS stores COMMAND.COM's name, as well as the boot drive letter and directory, in the "environment" as the value of the variable COMSPEC. Because you boot from the root directory of drive A:, the environment tells DOS to look there for COMMAND.COM. To get DOS to look in drive C: instead, you need to change the information in the environment.

The DOS command SET can be used to display or modify the environment. Entering SET alone displays the environment's current variables and their values. You can add to the environment (or change an existing variable's value) by entering SET followed by a variable name, an equal sign, and a value. You can remove a variable (and value) altogether by entering SET followed by the variable's name and an equal sign. To fix your RAM drive problem, add the command SET COMSPEC=C:\COMMAND.COM to your AUTOEXEC.BAT file after COPY COMMAND.COM C:\.

How does...? What can...? Should I...? Send your PC questions to The Help Screen; for details see How to Contact PC World, page 4. ●

And You Thought Computers Only Came With DOS.

Ordinary ones do. But the LASER 286/2™ comes packed with extras you won't find on other computers. Including a free copy of PC Tools™ Deluxe – the world's best-selling utilities software.

The LASER 286/2 has the power to run today's most popular software at twice the speed of the original PC/AT. Plus it includes 640K RAM (expandable to 1MB), a 5¼" 1.2MB floppy drive, eight expansion slots, and all the ports you need for a printer, modem and mouse.

The Laser 286/2 is more than loaded, though. It sells for remarkably less than other computers.

And you'll find it at selected department stores and computer shops nationwide – complete with a one-year warranty and, of course, PC Tools Deluxe, a $129 value.

For your nearest dealer, call 312/540-8911 (in Canada, 800/387-9672). Or write Laser Computer, Inc., 800 N. Church St., Lake Zurich, IL 60047-1596.

And get positive proof that power and performance needn't be expensive.

Or come with just DOS.

LASER

Laser Computer, Inc./A Video Technology Company

Circle 150 on reader service card

Introducing the first laser printer to let you do all this right out of the box.

Imagine being able to produce the kind of graphics and type fonts pictured here on your PC.

You probably can't.

Because even with today's advanced word processing programs, no other comparably priced laser printer can print sophisticated graphics or page layouts without additional options or add-ons that can end up costing you thousands of dollars more.

Which is why we designed our LBP-8 Mark III Series Printers to perform right out of the box.

With features like scalable fonts that let you create type in any size or rotation. Standard.

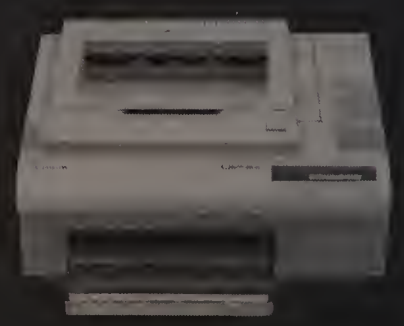
Enough memory to print a full page of text and graphics. Standard.

Plus an enhanced vector graphics command set that creates smooth lines and curves, eliminating the jagged edges you get with some laser printouts. Also standard.

And the Mark III is built around the reliable Canon SX engine and replaceable EP-S cartridge for quiet, dependable operation.

For professional-looking documents, reports, presentations, or whatever you need to print, no other printer does so much to improve your image.

For more information, call toll-free 1-800-453-3307.



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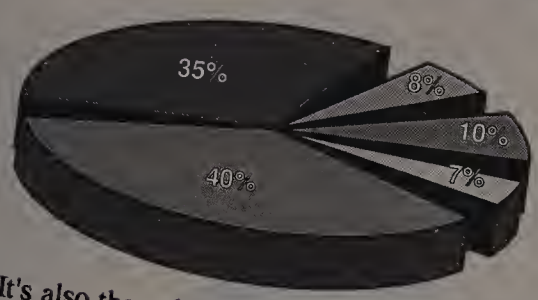
Canon

LASER BEAM PRINTERS



With Canon's LBP–8 Mark III Series Laser Beam Printers, you get all the enhanced graphics capabilities you need to work with advanced software programs like Word Perfect 5.0, Wordstar 5.5, Microsoft Word 5.0, Microsoft Windows, Lotus 1–2–3 and Digital Research GEM.

It's also the only laser printer to feature a National Semiconductor 32–bit microprocessor. So you can print even sophisticated graphics faster than ever before.

For versatility, three models are available offering additional features like automatic double–sided printing and dual paper cassettes that together can hold up to 400 sheets. And memory that can be expanded from the standard 1.5MB all the way to 4.5MB of RAM.

SCALABLE FONTS

With the Canon Printer System Language Controller (CaPSL), you can choose from nine scalable fonts that can be printed in almost any size you need, plus eight bit–mapped fonts, all standard.

AAAAAAAAAAAAAAAAAAAA

VECTOR GRAPHICS

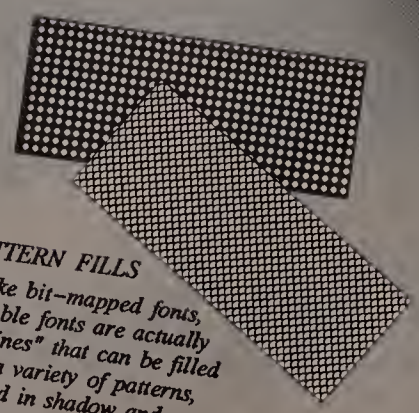
An enhanced vector graphic command set eliminates the jagged edges on large type and graphics you find with ordinary laser printouts.

128 FONTS
128 FONTS
128 FONTS
128 FONTS
128 FONTS

*128 FONTS **

A wide range of additional fonts is available on easy–to–install IC cards, including: Avant Garde, Bookman, Zapf Chancery, Century Schoolbook and more. 128 fonts in all.

* 128 per page



PATTERN FILLS

Unlike bit–mapped fonts, scalable fonts are actually "outlines" that can be filled with a variety of patterns, printed in shadow and various other graphic effects.

Canon LBP-8 mark III Series
LASER BEAM PRINTER

Working to improve your image.™

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Circle 55 on reader service card

Turn Your Time Into Profits...

For Companies Who Bill Labor And Materials.

Professionals:
- Advertising Agents
- Architects
- Graphic Artists
- Consultants
- Engineers
- etc.

Trades:
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- Contractors
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- Plumbers
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- Maintenance
- etc.

Manufacturers:
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- Glazing
- Packaging
- etc.

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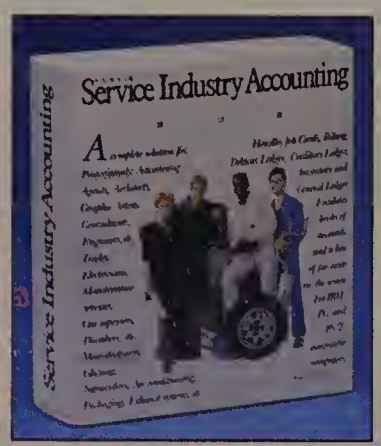

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Circle 86 on reader service card

NINE REASONS TO BUY CLIPPER WITHOUT A MOMENT'S HESITATION!

The Clipper language offers two compelling reasons to adopt it as your application development standard: open architecture and .EXE file generation. Clipper 5.0 boasts seven more. We think you'll be convinced before you reach number nine.

1 Open Architecture.

Clipper is both powerful and easy to use, with the most comprehensive command and function set available. Want more? Extend the Clipper language with user-defined functions written in Clipper, Assembler, C and other languages.

2 User-defined Commands.

Even more extensibility is available in Clipper 5.0. Support for user-defined commands allows you to tailor your command set to a specific business or industry.

3 .EXE File Generation.

Clipper's compiler yields stand-alone .EXE files for unrestricted distribution, requiring no LAN-PACKs™, no run-time modules and no licenses of any kind!

4 Break the 640K DOS Limit!

Improved memory management in Clipper 5.0, made possible by an exclusive version of Pocket Soft's .RTLink™, lets you run applications larger than 640K, without overlays!

5 Faster Development.

.RTLink features faster linking time and incremental linking, so only the changed object files get re-linked when you compile.

Clipper

5.0

GET IT FIRST, GET IT FREE!

6 Faster, Smaller Code.

Compiler directives allow more efficient execution with less code needed to accomodate varying PC configurations.

7 Multi-dimensional Arrays.

Accurate modelling of actual circumstances is enhanced by the power of multi-dimensional arrays.

8 New Documentation, Including an On-line Guide.

New and expanded documentation will make you immediately productive in Clipper 5.0. And you can access it all on-line through the included Guide to Clipper™ and Norton Guides™ Engine .

9 You Can Get It First!

Buy the current version of Clipper after June 1, 1989, register your copy, and be among the first to get Clipper 5.0—*Free!* You'll even save $100 off the suggested retail price of Clipper 5.0.

So, don't hesitate! Give us a call for the name of your nearest authorized dealer, and make your commitment to Clipper, today.

Clipper®

The Application Development Standard

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Circle 193 on reader service card

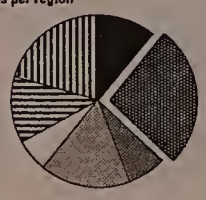
If you want better word processing, don't settle for Perfect.

REPORT TO THE FIELD

Shoe enough

Arbor Footwear comings and goings: Jim Dearing becomes V.P. Design for Arbor Evening and Dress wear. Greg Vroonas moves from Peoria to marketing in Miami. Joan MacArthur and Lisa Doan become account supervisor and media planner, respectively.[1] *Ridgley C.*

Sales per region



Northwest, Southwest, Northeast, Southeast, East, West, Midwest

Sales per region

Across the board it looks like the South once again led sales in FY '88. With the continuing pump craze those figures should maintain, if not improve.[2] *Jim W.* It's important not to let the other areas such as Northeast and Midwest fall.

Style:	Dress	Sport	Career	Casual
	Evening eel	Weekender	Tailor made	Trouser tip
	Midnight moccasin	Kickaround	Ladies wingtip	Loafer
	Twilight toeless	Runner up	M.B.A.-bound	Special spectator
Price:	$150-$350	$85-$125	$120-$250	$90-$150

The following are the most recent Telex numbers for the Arbor regional sales offices. All client and distributor inquiries should be directed to these numbers.

Los Angeles	05785
Atlanta	05786
Chicago	07658
New York	08857
Miami	05876
Detroit	06875

Young professionals use Arbor Walker to commute.

Soon, young professional women will no longer be using Arbor shoes simply to climb the corporate ladder. They'll be using them to get there.

This fall we're introducing the Arbor Walker — a shoe that goes quite a few steps further than the now-accepted but unattractive tennis shoes women have been wearing to and from work.

Made of Italian leather with a rubber sole, the Arbor Walker is the perfect combination of style and durability.

Arbor Walker designed by Pier Besto.

Look for promotional materials and carrying cases in early September. Our sales point is: "Women don't have to sacrifice looks for comfort."

SALES FORECAST FOR 1989 Types of shoes: Summer/Fall/Holiday/Spring

	1st quarter	*2nd quarter*	*3rd quarter*	*4th quarter*
Dress	95,000	87,000	120,000	60,000
Career	40,000	82,000	60,000	90,000
Casual	120,000	85,000	75,000	80,000
Sport	135,000	60,000	90,000	87,000
TOTAL:	390,000	314,000	345,000	317,000

[1] *Ridgley C. 9/27/88, 4:32 PM*
let's discuss forecast for media department expansion.

[2] *Jim W. 7/1/88, 1:15 PM*
Figures for Northeast and Midwest should be calculated separately mid-month let's catch them before they fall with promo.

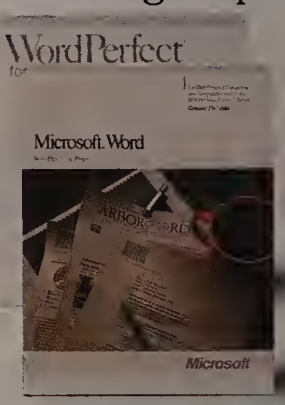
Text, graphics, fonts, annotations. Faster, simpler, cleaner. Compliments of new Word 5.0.

The trouble with WordPerfect® is, sometimes it isn't.

Not when you compare it to our new Microsoft® Word version 5.0. Not when you consider that with Word 5.0, you'll be able to pump out your day-to-day jobs quicker, easier, even smarter than you ever thought possible.

For example: With Word 5.0 you can choose commands by either using simple speed keys or just selecting from a menu.

You can create documents with about 50% fewer keystrokes than you-know-who. And now enjoy even more true WYSIWYG (What You See Is What You Get) thanks to our Print Preview.



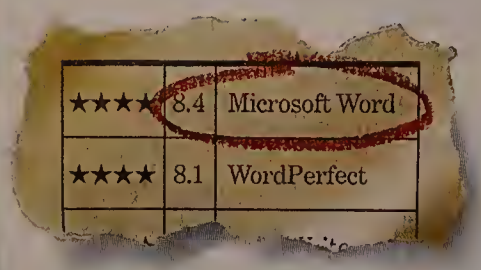
Introducing new Microsoft Word 5.0. When Perfect just isn't good enough.

Does WordPerfect give you the freedom to make annotations? Nobody's perfect. Does WordPerfect feature Outline View? Another imperfection.

New Word 5.0 also lets you list, search and archive files across multiple directories. And even link part, or all, of a Lotus® 1-2-3,® Microsoft Excel or Microsoft Works spreadsheet into a Word document. And then update it. All in a matter of seconds.

COMMON WORDPROCESSING TASKS		
Which requires fewer keystrokes?	Microsoft Word 5.0	WordPerfect 5.0
Copy Block	4	7
Delete Line	2	4
Italicize Word	2	5
Change Font and Size	6	9
Add Footer	1	7
Box Paragraph	5	12
Total	20	44

With new Word 5.0 you'll do about 50% less hunting and pecking than with WordPerfect.



Software Digest recently chose the best overall advanced word processor on the market. Who won? In a word, Word.

Which one brings your word processing closer to perfection?

Microsoft®
Making it all make sense™

Output printed by the Hewlett-Packard® LaserJet Series II® printer. Customers in Canada, call (416) 673-7638. Outside North America, call (206) 882-8661. © Copyright 1989 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and the Microsoft logo are registered trademarks, and *Making it all make sense* is a trademark of Microsoft Corporation. Hewlett-Packard and LaserJet Series II are registered trademarks of Hewlett-Packard Company. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. WordPerfect is a registered trademark of WordPerfect Corporation. Software Digest rating from April 1989 issue. This offer valid only in the 50 United States.

WINDOWS JOURNAL

First-hand dispatches from the Windows front

FileShare from Saros Corporation is an innovative groupware application that uses the Windows environment to let individuals and groups network with equal ease.

Stewart Alsop

Okay, I've complained enough about *Windows* software. I've moaned that there aren't enough games, that the software we do have is either a port of Macintosh software or just like equivalent programs on the Mac, and that the *Windows* interface is missing some basic elements common to most other graphic user interfaces.

Now, I'm happy to report, we're finally beginning to see some innovative software being written for *Windows* that explores areas of personal computing that have never been looked at before. One product in particular stands out: Saros Corporation's *FileShare*.

ANTHONY RUSSO

Network Integration

Saros introduced *FileShare* in June of this year. Not too many people noticed, mainly because most people had no idea what "Advanced Distributed Application Services" were. That's the category of software Saros would like *FileShare* to be included in.

Aside from its complicated description, *FileShare* is actually pretty simple. It's a set of software that organizes files on a network and gives users access to both personal and shared files on a network server. The server-based part of the software is a *LAN Manager* application that works with *3+Open* or other implementations of *LAN Manager* from hardware companies. The client part, or the software that lets the end user get access to the network, is a *Windows* application that coexists very neatly with other applications and doesn't force users to change the way they already work with *Windows*.

Saros has a long and involved sales pitch about why network administrators and users alike would benefit from *FileShare*. But the fact is, the pitch is true. *FileShare* is the first set of software I've seen that could motivate people to brave the horrors of PC-based networking. I'll go even further: I think *FileShare* is the first groupware to successfully balance the needs of both individuals and groups. Saros has created a piece of usable groupware that not only will become a successful product but will launch other new products as well.

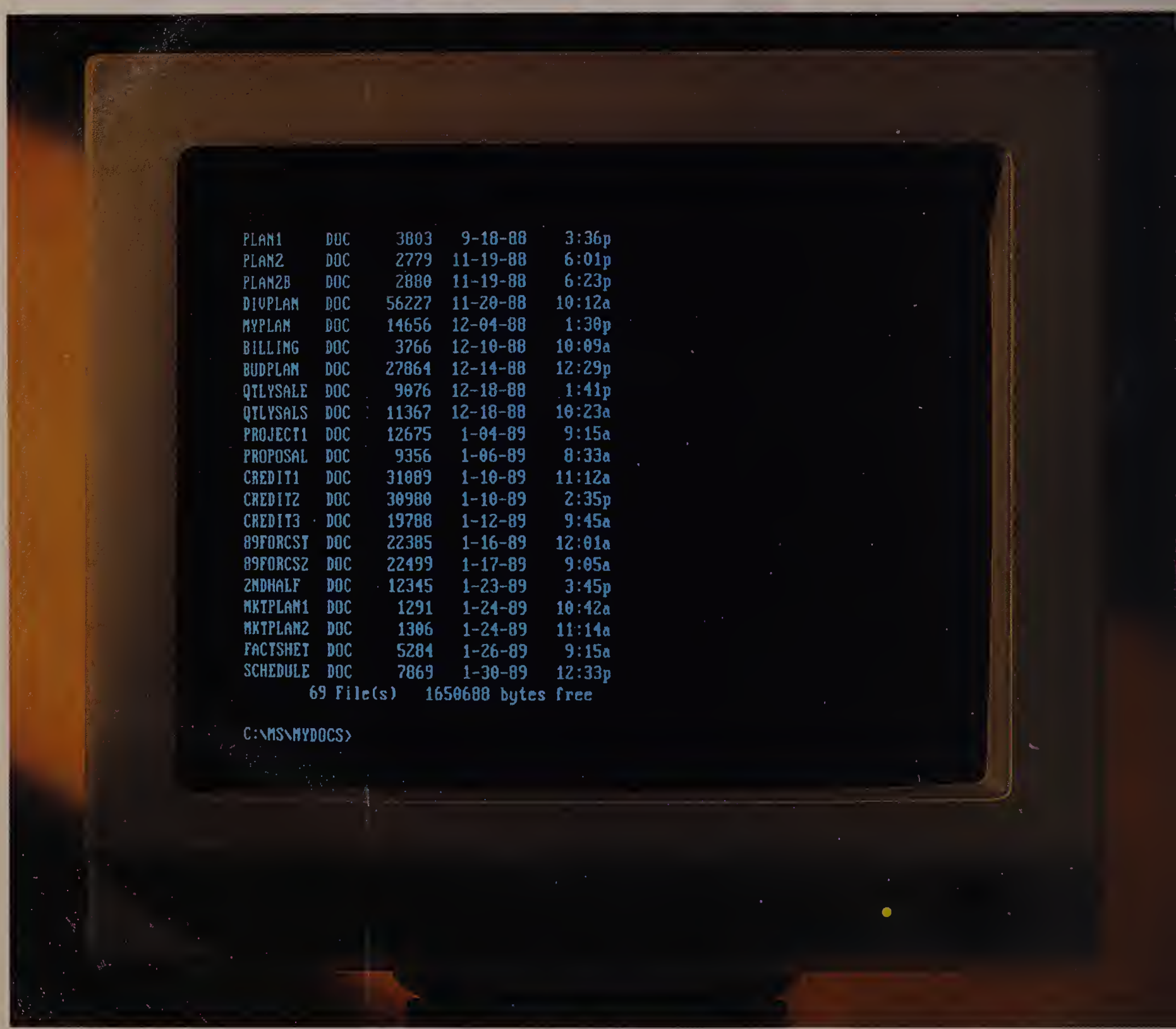
Since groupware began to appear about 18 months ago, most of the programs being promoted—like *Notes* from Lotus or *Syzygy* from Information Research—try to deliver some new, whizzy benefit to users, such as organizing communications among work-group members or setting priorities for group projects. The problem is that users (and network administrators) generally need to solve everyday problems. And that's exactly what *FileShare* does, in an elegant, easy-to-understand, unobtrusive way.

A Library Scenario

FileShare's client application gives you a way to check files in and out of the network, turning the LAN into a kind of library, with the network administrator as librarian. Since the main idea behind a network is to let users share files, *FileShare* automatically keeps track of who checked out which files and how changes to the original files were recorded. In other words, if Sam checks out the July status report to update the Western regional sales data, and Bill checks out the same file at the same time

(continues)

Do they call it a h
it's so hard to find wh



You're looking for a specific piece of information on your PC. But you can't remember which memo, spreadsheet or even which file it's contained in.

And you're certainly not about to search through each directory, much less load and unload every file to find it.

That's why we created Magellan.® The first utility that helps you find your files by letting you instantly see their contents as

[1]Applications supported in SpeedView include Lotus 1-2-3, Symphony®, Manuscript®, Agenda®, WordPerfect, dBase®, MultiMate®, Microsoft® Word, WordStar®, DisplayWrite, all ASCII files, plus many more.

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ard disk because
at you're looking for?

ney appear in your favorite applications.

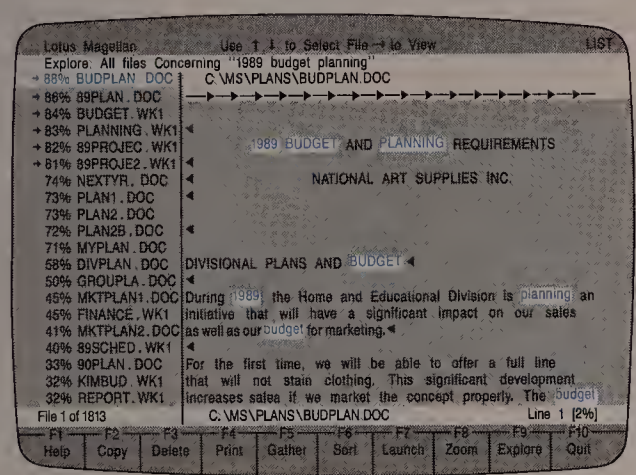
Without even having to load the specific pplications that created the file.

With Magellan, all you need is a general lea of what you're looking for.

Because unlike other programs, the Magellan Explore function can perform a earch on a phrase, a topic, an idea or even an ntire file. Not just key words.

Then it lists your "found" files on the eft of your screen in order of how relevant he contents re to the earch topic.

As fast s you can croll down his list, the Magellan SpeedView unction instantly displays he complete contents of each file on the ight of your screen, highlighting the relevant ext for you.

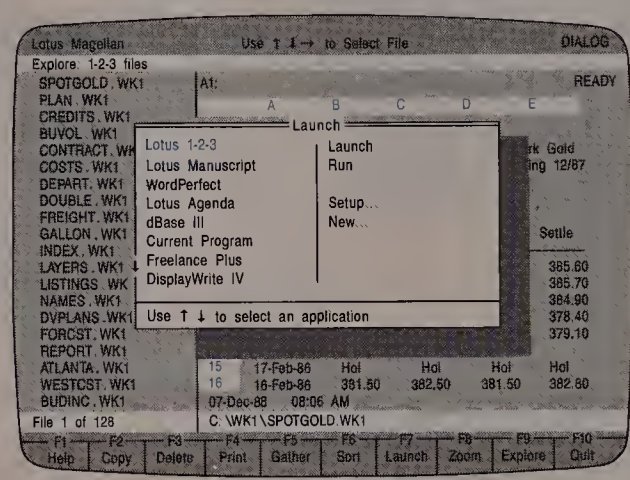


The Magellan Explore and SpeedView functions let you locate everything related to a particular topic and see it as it would appear in its native application.

Using the information is easiest of all. Because all it takes is one keystroke to launch nto the application that created the file, and t'll be loaded and ready to go.

Or you could use Magellan to gather the information you choose from several different applications (like a 1-2-3® spreadsheet and a WordPerfect® memo)[1] and put it into a single file so you can start using it right away.

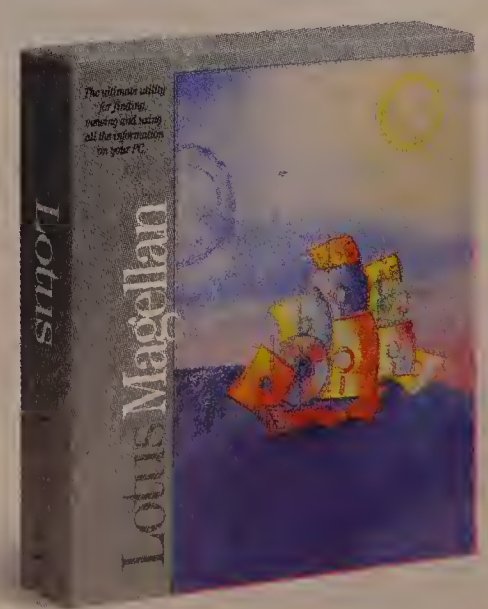
Best of all, you're productive literally five minutes after installing Magellan. The menus are intuitive, and everything you need to run the program is on the screen right in front of you. Which means that there is virtually no learning curve.



With one keystroke, Magellan loads the selected file and application, in this case 1-2-3, so you're ready to go to work.

Call 1-800-345-1043 for your free Magellan demo kit. Ask for APU-3593 to learn more on why Magellan is the quickest, easiest way to access all the information on your hard disk.

That way, you can spend time working with information, instead of just looking for it on your PC.



Introducing Lotus Magellan

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MapInfo software can find, display and analyze your data geographically. See your prospects, customers, facilities —anything in your database. Find addresses by street, ZIP code, city, etc. (We can even supply the maps.)

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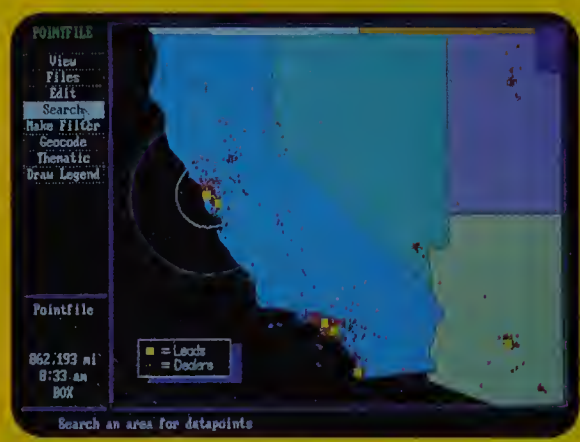

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Circle 161 on reader service card

but updates the Eastern regional sales data, *FileShare* can compare the changed versions and merge them (since different parts of the file have been changed). If the same part of a file is changed, then *FileShare* keeps separate copies and alerts the author of the file that there is an unresolved conflict.

When you're dealing with a file in *FileShare*, though, you're not just dealing with a typical DOS directory: an eight-character file name with a three-character extension, plus the file's creation date and size. Instead, *FileShare* tracks up to 46 different attributes about a file, including file name (still limited to the familiar 8.3 format), author, type of document, version number, modification dates, number of copies checked out, and up to 20 custom attributes. The server software keeps track of where files are, according to rules set up by the network administrator, but you can use any of the 46 attributes plus an unlimited number of preassigned keywords to retrieve and/or manage files or versions of files.

The Information Deluge

Take my word for it, this is sophisticated stuff. It's the first software I've seen anywhere (including on those big UNIX networks) that really improves the fundamental way computer users deal with networks. The problem is that, if all of the whizzy stuff that the industry has been talking about comes true, even people on networks of only six to ten users will have to navigate hundreds or even thousands of files stored in hundreds of megabytes of disk space. And working your way up and down subdirectories just ain't productive, especially when those directories might be four or five levels deep and hundreds of levels wide.

FileShare gives you a way to filter out all the stuff you don't care about, to organize files that matter to you, and to sort through and control the growth in your files logically and intuitively—all without giving up any of your own software or local disk space.

FileShare is not just another application. It's special because its developers have chosen *Windows'* graphic user interface to make the job of networking easier. To solve complex problems simply, *FileShare* breaks with tradition in the way it represents the network to users, allowing them to manipulate information more simply, clearly, and directly. Now that's what I call innovation. ●

Stewart Alsop is editor and publisher of P.C. Letter *and a contributing editor for* PC World.

WHERE TO BUY

FileShare
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PC MAGAZINE

BYTE AWARDS

Fastback Plus

Fastback—a program that backs up your hard disk—*is* fast, and it is reliable. Now Fifth Generation has improved it. The company fixed the manuals and then put in help files that make the manuals nearly superfluous. Then it added data compression to save disk space and a utility that estimates how many floppy disks and how long the job will take.

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PC WORLD

EXECUTIVE SUMMARY

Fastback Plus 2.0

Hard disk backup utility

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	POOR	FAIR	GOOD	EXCELLENT
Speed				●
Backup selectivity				●
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Overall value				●

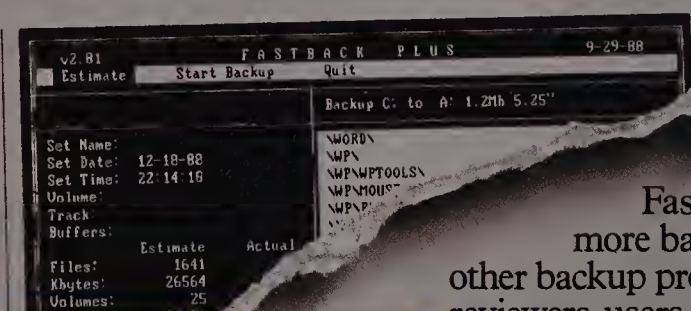
Fastback Plus 2.01: No More Backup Excuses

PC HANDS ON

BY EDWARD MENDELSON

The best backup program is the one that gives you the fewest excuses not to use it. Fifth Generation Systems' $189 *Fastback Plus*, Version 2.01, pulls out the rug from under almost every antibackup excuse you can imagine.

Do your backups take too much time? *Fastback Plus* can back up 10MB of a real-w[illegible] hard disk to a single [illegible] drive in 4 minutes [illegible] yourself [illegible] ly [illegible]



in the program [illegible] quic[illegible]

Fastback Plus gets more backing than any other backup program. From reviewers, users and corporate MIS. In fact, it's now the standard by which all other backups are judged.

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Circle 71 on reader service card

Edited by ERIC BENDER

Adding Graphics Packages

Aldus Broadens Attack on Desktop Publishing

Do Flat Sales Show Saturation?

Aggressively pushing color and other technologies, Aldus will maintain its desktop lead, says Paul Brainerd.

At Aldus Corporation, success has always been spelled *desktop publishing*. President Paul Brainerd coined the term, and *PageMaker* led the gold rush into page layout. But as the desktop publishing boom levels off, the Seattle supplier must diversify its product line and ward off increasing competition on all sides.

Brainerd was running the Redmond, Washington, plant of Atex Inc., a supplier of electronic publishing systems for newspapers, when Kodak bought Atex and shut down the plant. He founded Aldus with four Atex engineers in early 1984, and the Macintosh version of *PageMaker* shipped in July 1985. A *Windows* release followed in January 1987.

Both packages garnered their share of industry awards, and Aldus secured strategic alliances with Apple, IBM, Hewlett-Packard, and others. Aldus's sales soared to $39.5 million in 1987, topping $79 million last year.

The firm employs more than 500, and it's moved overseas aggressively—*PageMaker* is distributed in 11 languages in 35 countries, and slightly over half its sales are international.

But the days of explosive growth are gone, industry analysts say, and Aldus's sales actually dropped 12 percent from the first to the second quarter of this year. Brainerd cites two factors: a lull between product introductions, and an overstuffed distribution channel. "We haven't seen any change in end-user demand at the retail level," he says. However, some financial analysts saw the signs of a saturated market and lowered their rating for Aldus stock.

Revenues should climb by year-end as several packages debut. Aldus, which aims to provide all products on both Macintosh and IBM platforms, will introduce a PC version of *Persuasion*, its Mac graphics package. A version of *PageMaker* for OS/2 Presentation Manager is slated for the third quarter. In addition, analysts expect a major new release of both PC and Mac versions of *PageMaker* this year.

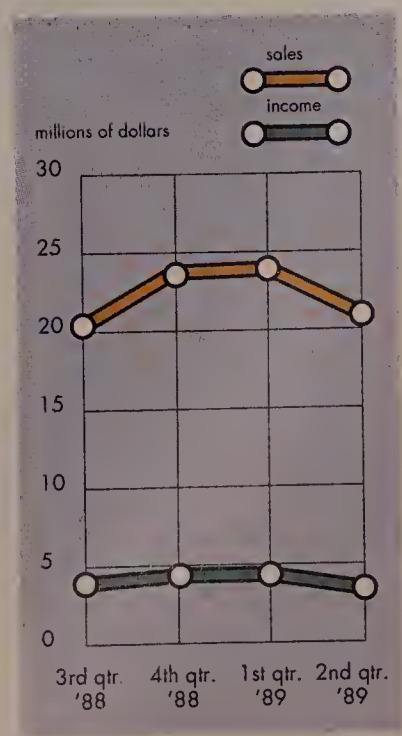
But there's increasing competition on the home turf. *PageMaker*'s main rival has always been Xerox's *Ventura Publisher*—analysts say each program takes about 45 percent of the PC page-layout market. This fall Xerox is expected to attack the Mac market, of which *PageMaker* has about a 70 percent share.

A greater challenge may come from word processing packages, which are rapidly adding page layout features and becoming increasingly attractive to casual business desktop publishers. "There's definitely a squeeze occurring at the low end of the market," says Bruce Lupatkin, a senior technology analyst for Hambrecht & Quist in San Francisco.

"It's an oversimplification by far to say that word processing and page layout can replace one another," Brainerd responds. However, he agrees that graphic artists and business professionals have different needs, and suggests that in time the product line will split.

Aldus's longer-term challenge is to broaden revenues, about 85 percent of which are still linked to *PageMaker*. The company continues to *(see Aldus, p. 62)*

Aldus Sales: Topped Out?



Some analysts see Aldus's dip in sales as a preliminary sign of saturation in the desktop publishing market.

PC Memory Prices Fall

Consumption Doubling This Year

Now that the DRAM (dynamic random access memory) shortage has subsided and prices are falling, look for cheaper and more plentiful PCs and add-in memory products over the next six months. PC powerhouses like Compaq, AST Research, and Everex have slashed prices. And most plan further cuts—a challenge that less–well-heeled brands will hardly resist.

System memory prices fell 15 to 20 percent at Compaq and 8 to 23 percent at Everex this spring in response to the increasingly bountiful supply of 1M-bit and 256K-bit DRAMs. AST made several incremental price cuts during the first half of the year, culminating in a July adjustment of 21 to 26 percent.

AST, also the leading maker of memory add-ons, paired those cuts with the debut of a RampagePlus 286 board that is about 15 percent cheaper than previous iterations. Both AST and its closest rival, Everex, report that their resellers (who plug in the memory chips) are selling cheaper and fatter memory cards. AST executive vice president Tom Yuen points out that he and his competitors have closely mirrored—even anticipated—price cuts from their component suppliers, a trend he expects to continue.

But analysts advise against waiting for the cutthroat prices of the last down cycle. The Japanese giants, who started the 1984 memory price war and now control 90 percent of the market, have no intention of staging a repeat performance. Instead, they will provide a floor under prices, leaving smaller players like Texas Instruments and Motorola to take the price lead, notes Jim Feldhan, vice president at market research firm In-Stat, Inc., of Scottsdale, Arizona.

Still, it's a capital-intensive, long-cycle industry that defies control, as the DRAM shortage of 1987–88 demonstrates. Memory suppliers were caught unawares by a boom in PC sales just as they shifted production capacity from 256K-bit to 1M-bit chips and before they reached acceptable 1M-bit yields. The supply/demand equation didn't stabilize until early this year.

Even so, the Japanese will be able to exert upward price pressure, says In-Stat senior analyst Mike Feibus. He suggests that the per-unit price of 256K-bit DRAMs will probably drop to an average of $2.26 this year, still above 1986's low of $2.14.

Many U.S. PC makers, forced to raise prices 20 percent or more during the shortage, accuse Japanese firms of favoring their own subsidiaries. "Current prices on DRAMs are 20 percent cheaper in Japan than in the U.S.," says Yuen, who blames the "fair market value" prices the U.S. government began enforcing in 1986 to protect domestic chip makers. Since the U.S. industry was all but wiped out, the tariffs now favor Japanese suppliers in what Yuen calls "a kind of artificial manipulation."

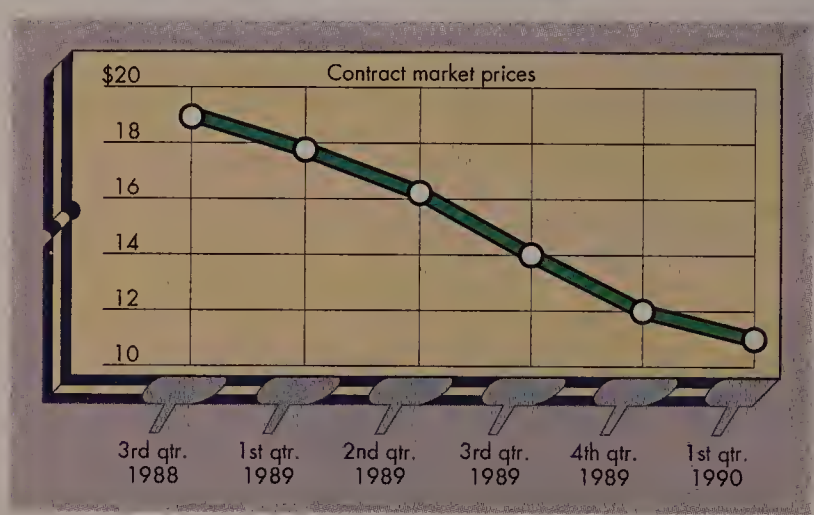
The proliferation of graphic user interfaces and memory-intensive applications keeps memory demand soaring. In-Stat expects DRAM consumption for PCs to hit 348 million megabits this year, more than twice the 167 million megabits sold in 1988. Sales of add-on board memory should total 23 million megabits this year, up about 82 percent from last year.

Ironically, sales of memory boards themselves are being curtailed by increased shipments of 386 PCs with more and more memory built in. It isn't unusual for engineers and other power users to load up 386 machines with 8MB or more, points out Mike Swavely, Compaq's president for North America.

IBM began delivering 4M-bit chips in PS/2 boards this summer, and other vendors will follow this fall. While prices will initially be high, 4M-bit chips will accelerate the trend toward cramming more memory onto motherboards. Swavely's only concern is the potential for a memory imbalance during the changeover from 1M-bit to 4M-bit when the industry is most vulnerable.

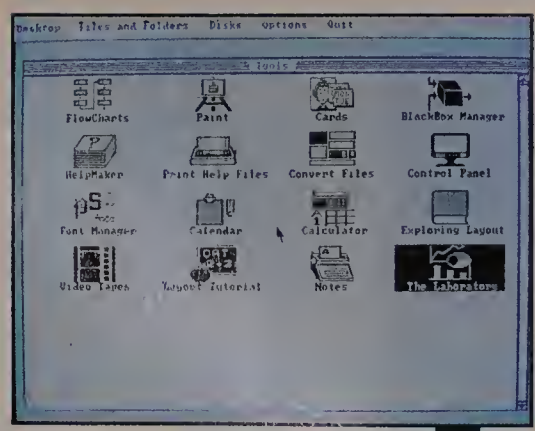
The bottom line: Now is as good a time as any to pick up that extra memory. —*Mike Hogan*

DRAM Price Declines



As supply has caught up with demand for 1M-bit DRAMS, contract market prices have fallen. More volatile spot market prices that ranged as high as $30 during third quarter 1988 have plummeted as well.

Don't Let the Desktop Programming Revolution Start Without You.



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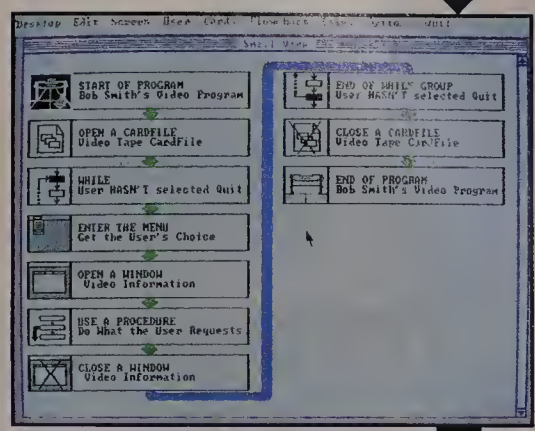
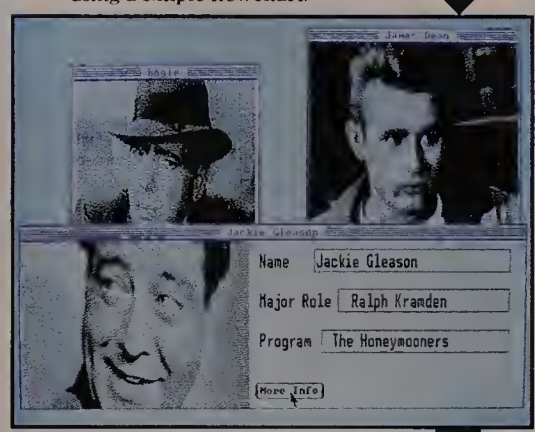


Design and build your programs by using a simple flowchart.



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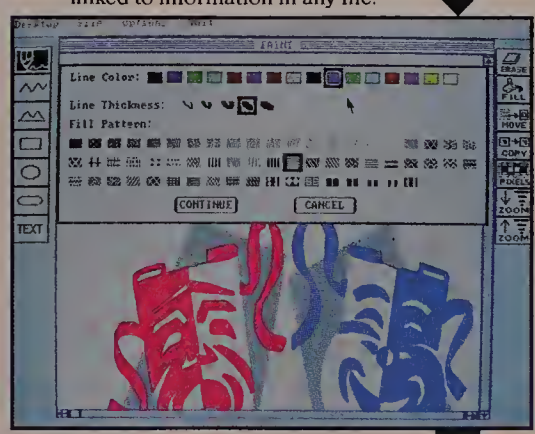

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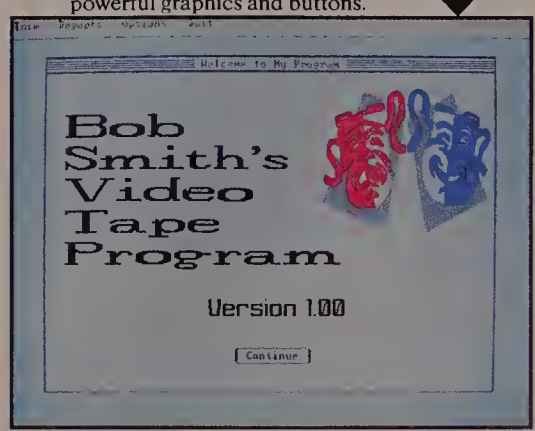

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July 3, 1989

REPORT CARD

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PC Illustration Software

	(InfoWorld weighting)	Adobe Illustrator Windows Version 1.0	Arts & Letters Graphic Editor 1.02	Corel Draw 1.01	GEM Artline 1.0	Micrografx Designer 2.0
List price		$695	$695	$495*	$495	$695
Performance						
Speed	(125)	Poor	Satisfactory	Very Good	Very Good	Very Good
Input/output	(125)	Good	Good	Very Good	Good	Excellent
Drawing/editing	(200)	Good	Good	Very Good	Satisfactory	Very Good
Documentation	(100)	Excellent	Good	Excellent	Satisfactory	Very Good
Ease of learning	(100)	Very Good	Good	Excellent	Good	Very Good
Ease of use	(100)	Satisfactory	Satisfactory	Very Good	Satisfactory	Good
Error handling	(75)	Good	Satisfactory	Good	Satisfactory	Good
Support						
Support policies	(50)	Satisfactory	Satisfactory	Good	Poor	Poor
Technical support	(50)	Good	Very Good	Very Good	Good	Good
Value	(75)	Poor	Satisfactory	Excellent	Good	Very Good
Final scores		**5.8**	**5.7**	**8.0**	**5.6**	**7.2**

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Banyan Seeks Partners to Grow VINES Networks

Spreading the Word on StreetTalk

Powerful 386-based network data base servers, claims Banyan's David Mahoney, "will outperform most VAXs."

RICHARD HOWARD

Six years ago when Banyan Systems drafted its *VINES* (Virtual Networking System) architecture, the start-up focused not on PC work groups but on far-flung corporate nets. Technically, the approach was exemplified by StreetTalk, the *VINES* directory system that lets users easily tap resources across multiserver nets.

Only problem: Almost no one was installing multiserver nets at the time. As one Banyan exec puts it, "We designed a product for a market that didn't exist."

But the market is flourishing now as corporate customers connect their local area nets, and "Banyan really has an advantage over just about every other vendor," says Nina Burns, vice president at Infonetics, a San Jose, California, consulting firm. Winning a string of juicy contracts away from Novell, IBM, and other serious competitors, this year Banyan expects to almost double sales to $90 million.

As employee count neared 500, Banyan moved into new headquarters in Westborough, Massachusetts, in July. In recent months, it has broadened *VINES* communications hooks, inked a SQL server deal with data base highflier Oracle, added Macintosh support, launched an ambitious training/service program, and laid the groundwork for an aggressive push overseas.

Perhaps most crucial, however, was the February debut of a comprehensive tool kit for the UNIX-based *VINES*. Banyan president and cofounder David Mahoney acknowledges that developers would have liked earlier access to these tools, but until now Banyan couldn't dedicate the support staff. This delay has slowed creation of *VINES*-specific applications. "*VINES* has the basic applications, but it doesn't have the vertical support that *NetWare* has at the grass-roots level or the clout that *LAN Manager* is getting from the big vendors," says International Data Corporation analyst Lee Doyle.

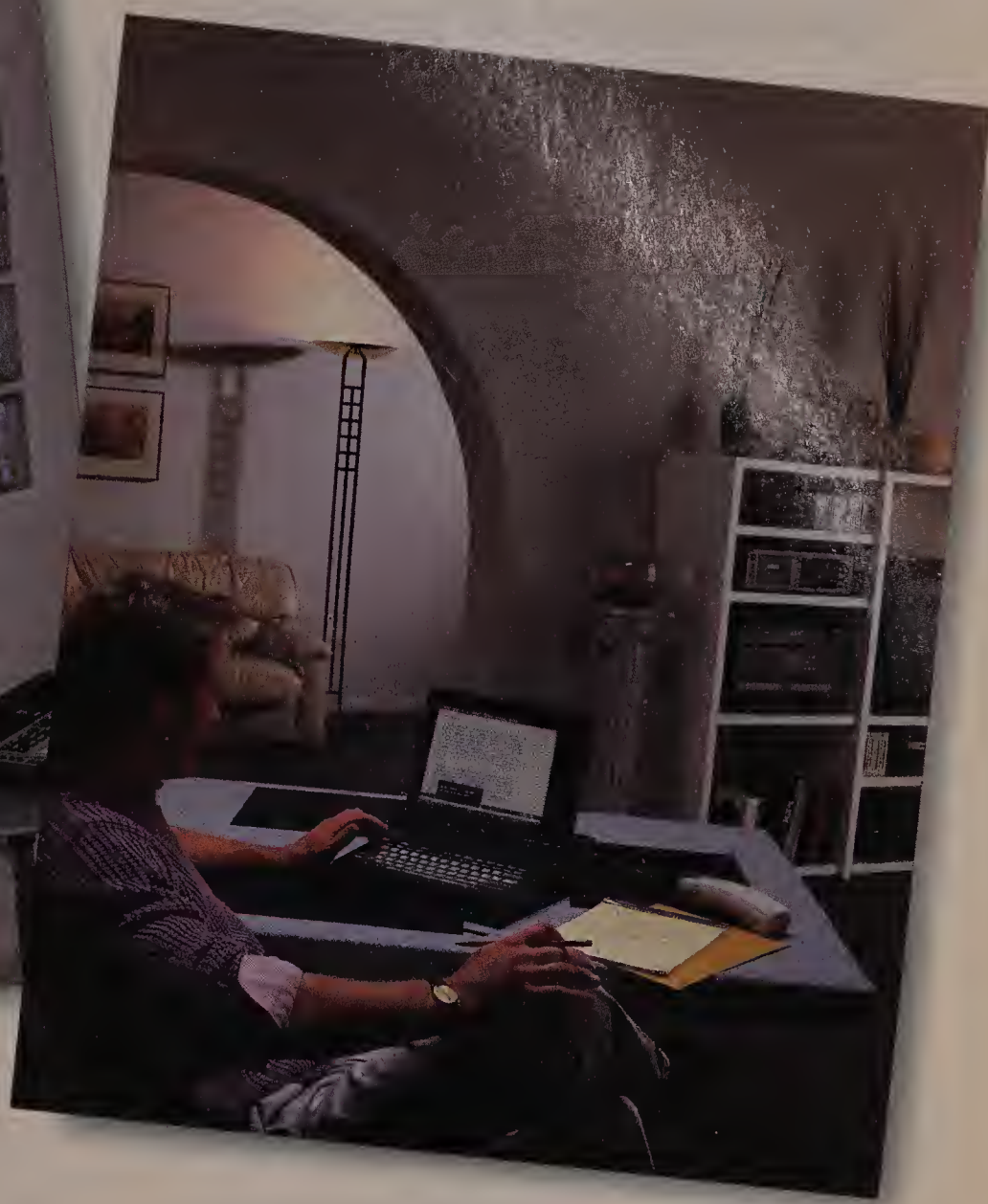
Another vital concern is customers' ever-lengthening wish list for means to tie *VINES* to various communications environments, PC hardware, and other components. "It's tough for a company spending, say, $8 million on R&D, to compete with the big guys," Doyle notes. Mahoney acknowledges the point, and says the answer is partnerships like those Banyan has built with Oracle, Wang, and other manufacturers and software houses.

While paper-thin profit margins are pulling rival Novell away from hardware offerings, Banyan will keep selling specialized PC servers and adapters. "We were never in the same bind as Novell, which has always been in the commodity market," Mahoney says. "We build hardware to add value to our software." However, Infonetics's Burns suggests, "users are looking at servers as a commodity—as they start to see performance degrade, they slap another server on the net." That, she says, leaves Banyan exposed to "more and more pressure from PC vendors."

Minicomputer makers, though, are watching Banyan eat their lunch. "I go to customer meetings, and customers are asking, 'Why are we buying [IBM] AS/400s?'" Mahoney says. PC nets now can boast industrial-strength data base servers like Oracle's new *VINES* product, which, Mahoney says, "will outperform most VAXs, and it's 100 percent compatible with the data base management system running on the VAX."

Banyan has turned a profit for 11 straight quarters, and many expected it to go public this year. Mahoney says the timing for that move depends partly on a favorable climate for high-tech initial public offerings and partly on the company's strengthening some aspects of business. The challenge of maintaining a strong and deep management team suffered a setback in May when Mahoney's second-in-command suddenly quit.

While Banyan's near-term prospects are bright, "the tricky part is what happens around 1991," comments Doyle. "IBM has been very poor at implementing and marketing its PC net systems," but it's putting a formidable effort into OS/2 nets. And as other suppliers also aim to close the technical gaps, "Banyan has its work cut out for it," says Burns. "But it also has a wealth of opportunity." —*E. B.*



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Circle 167 on reader service card

Spreadsheet Aftermarket Putters Ahead—Slowly

Consumers Not Getting the Word

Personics's Mark Peterson says the new 1-2-3s present both opportunities and obstacles for aftermarket vendors.

The new versions of *1-2-3* have finally appeared, but the Lotus aftermarket "is not healthy, to say the least," remarks Jeffrey Tarter, publisher of the *Soft-letter* newsletter in Cambridge, Massachusetts. While hundreds of software houses have written add-ons and add-ins for the spreadsheet, consumers know about precious few, says Tarter, partly because Lotus is making only halfhearted efforts to support its *1-2-3* supporters.

"A lot of vendors have dropped out," adds Mark Peterson, president of Personics in Maynard, Massachusetts, one of the largest and healthiest of the aftermarket suppliers. But a Lotus developers' conference last summer drew hundreds, and "it seemed like everyone was very enthusiastic about the new releases," he says.

Like other firms, Personics is pondering where to place its development bets. "It's a tense period for us," says Peterson. Which products should target *1-2-3* release 3, the powerful and power-hungry version that shipped in June and won't accept earlier add-ins and add-ons? Which should be tailored for release 2.2, the more conservative version that arrived in early August and will work with earlier packages?

Despite the turmoil for aftermarket companies and Lotus alike last year, "major titles came out, they're selling well, and we don't see that the aftermarket has dropped off," says Marcie Troisi, Lotus's manager of developer marketing. She points out that Lotus offers developers services like discounted software and an annual product guide, and plans to start a CompuServe bulletin board.

But Tarter insists that Lotus skimps on the crucial question of customer exposure. He points to the Lotus Selects catalog, which started out as a way to promote aftermarket products; these products now may get lost among other catalog items that have no specific link to *1-2-3*. And if a developer wants to rent customer mailing lists, "Lotus charges some of the highest rates in the industry," he says. —*E. B.*

Karen Sorensen is a freelance writer in Palo Alto, California.

Aldus

(continued from p. 57)

evaluate other areas for diversification, including forms production, image editing, and technical publishing, says Brainerd.

Additionally, technical advances such as improved color support should fuel future growth. "As personal computers like the PS/2 and Mac II become more capable of handling color, we will try to educate the market and get the standards issue resolved," Brainerd notes. "We are investing heavily in color to try to remain in a leadership role."

Earlier this year, Aldus introduced *PageMaker Color Extension*, a color add-on, as well as the Open Prepress Interface (OPI), a proposed standard for transferring desktop-produced pages with information on color photographs to prepress color separation systems. OPI has been endorsed by Crosfield, Hell Graphic Systems, and other prepress vendors.

Jonathan Seybold, an electronic-publishing expert in Malibu, California, expects Aldus to beef up network multiuser features as well. Seybold also sees greater focus "on issues that go beyond page makeup and composition, such as interoperability between programs, and building support for multiple-vendor environments."

A note of caution: While Aldus's attempts to broaden its franchise (with offerings like the *SnapShot* electronic photography package) have been thoughtfully designed and targeted, "so far Aldus hasn't been that successful in introducing new products," says Hambrecht & Quist's Lupatkin.

But analysts anticipate that the company will weather its challenges well. The company will hit $95 million in revenues this year and $120 million in 1990, estimates David Bayer, analyst for Montgomery Securities in San Francisco. "There's no question that Aldus's growth rate has slowed, but we think the company has a good future," agrees Christopher Mortenson, principal of Alex. Brown & Sons in Baltimore.
—*Karen Sorensen*

RICHARD HOWARD

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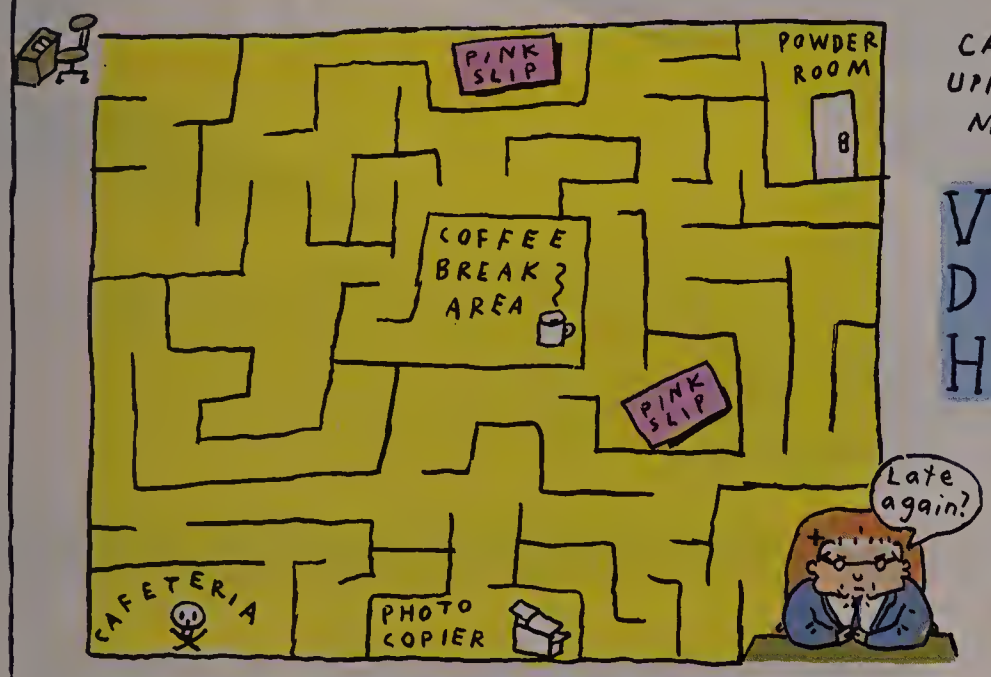

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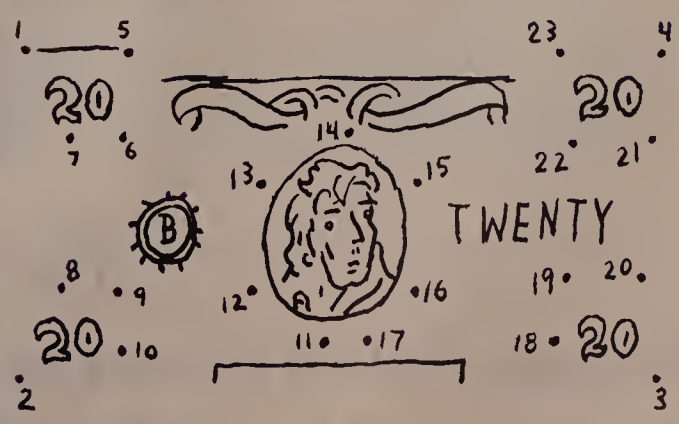

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ALR's True-Blue 486

The PowerCache 4 combines the Micro Channel bus with a unique memory architecture for top 486 performance potential, while the 286-based PowerFlex promises a 486 upgrade.

Eric Knorr

Pairing a 486 with an AT-type architecture isn't quite as bad as strapping a jet engine to the family sedan, but the match could be better. So when Advanced Logic Research (ALR) built their first 486 machine, the PowerCache 4, they decided to use a Micro Channel bus.

The PowerCache 4 is the first true 486 system. Like IBM's PS/2 Model 70-A21 with its 486/25 Power Platform upgrade, the PowerCache promises to exploit the Micro Channel's wide bandwidth and support for intelligent peripherals, delivering I/O that can keep pace with terrific processing power. But unlike IBM's system, ALR's unit offers a specially designed memory cache external to the chip, which should result in significantly faster memory access.

PC World previews are informal assessments of products that at press time were still in the development stage. Complete reviews—including features evaluations and performance testing—will appear only after a product is officially released.

ALR's PowerCache 4, the most promising 486 box yet.

DAN MITCHELL

Scheduled to ship in mid-October, the PowerCache desktop unit costs $9990 and comes standard with 2MB of RAM, a 130MB ESDI hard disk, a 1.44MB floppy drive, a VGA board, a parallel port, a serial port, a mouse port, and a keyboard. That beats the pricing on IBM's 486-equipped Model 70 by about $3000.

Along with the PowerCache, ALR announced the PowerFlex, a 12.5-MHz 286 system with an AT bus that you can convert to a 386SX or—come November—to a 486, using a bare-bones upgrade board that installs without making you remove the CPU. Sporting the same small footprint as the desktop PowerCache, the PowerFlex starts at an amazingly low $1495, which includes 1MB of RAM (expandable to 5MB on the motherboard), a 40MB hard disk, and a 1.44MB floppy drive. The 386SX upgrade board goes for only $395, but the 486 upgrade will weigh in at $2995.

Caching In on the 486

ALR isn't known for its technological timidity, and the PowerCache demonstrates plucky design once again. The chief innovation is ALR's external memory caching architecture.

With DOS applications, the 486 almost always finds what it needs in its own built-in 8K cache of very fast RAM, without having to go to slower main memory. But with large-memory multitasking or multiuser applications, the processor finds what it's seeking less often, increasing the number of cache misses.

The main advantage of ALR's scheme is that it

capitalizes on the 486's burst mode, the processor's course of action on a cache miss. In burst mode, the 486 gorges itself on data (32 bits per clock cycle), quickly filling its 8K internal cache. The processor thinks it's fetching the data from main memory, while in fact it's grabbing it from ALR's fast 128K cache. This, along with a "write-back" caching scheme that ensures that the 128K external cache has valid data, keeps the 486 at arm's length from main memory (where the system would have to insert wait states, slowing processing throughput).

ALR arranges its cache in two 64K banks, facilitating 128-bit, one-cycle transfers between the external cache and system RAM—faster than the 486 can devour data. Each bank supports its own main memory in the form of 80ns SIMMs (Single In-line Memory Modules). You upgrade the system four SIMMs at a time; with 4MB SIMMs, the system will be able to access up to 32MB of CPU-speed RAM.

Making the Most of the Micro Channel

No small architectural feat itself is the PowerCache's Micro Channel bus. Last April, when ALR released the MicroFlex 7000, the company joined the exclusive club of manufacturers willing to shoulder the Micro Channel's required R&D and licensing fees.

SNAPSHOT

PowerCache 4

A unique memory architecture and support for intelligent peripherals make this 486 system the first to take full advantage of the new chip.

KEY FEATURES

- **Micro Channel architecture**
- **128K external memory cache**
- **Up to 32MB of CPU-speed RAM**
- **Optional intelligent SCSI controller**

AVAILABILITY

Scheduled for October

PRICING

$9990 to $16,490

Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
714/581-6770

Reader service no. 750

The most interesting Micro Channel option for the PowerCache is Adaptec's intelligent SCSI controller, which drives an 18ms 130MB hard disk. This device is a true bus master, which means, among other things, that it can send bursts of data from its 32K disk cache through the Micro Channel to memory without involving the CPU.

The benchmarks aren't in yet, but the SCSI controller may be one of the first bus master devices to demonstrate the Micro Channel's special disk I/O advantage—for multiuser or multitasking applications, that is. In a single-user DOS workstation, ALR acknowledges that the controller actually slows some operations.

The PowerCache's motherboard offers four 16-bit and two 32-bit Micro Channel slots—three more than the IBM Model 70 has. Unlike the PowerCache, the Model 70 has a VGA and a hard disk controller built in, leaving the PowerCache a winner by only one slot in practical terms. The desktop model of the PowerCache also one-ups the Model 70 in device capacity, providing room for four rather than three drives.

Like IBM's PS/2 systems, the desktop PowerCache holds together with handy thumbscrews and pressure-sensitive fasteners. The PowerCache also comes in a tower chassis with room for six devices, one of which can be an internal full-height drive. Standard ESDI drive options for the tower include 150MB, 340MB, and 650MB units.

The 286-based PowerFlex has the same drive capacity as the PowerCache desktop. Of course, without an external memory cache for its 486 upgrade or Micro Channel support for bus masters, loading a 486 engine into this baby would leave it at the bottom rung of 486 performance. Think of it as a whale of a deal in a single-user workstation, and hold off on that 486 upgrade until the chips are cheap.

SNAPSHOT

PowerFlex

The base system is a small-footprint, low-priced 286, but one plug-in $395 upgrade module turns it into a 386SX, while another $2995 unit converts it into a 486.

KEY FEATURES

- **Upgradable CPU**
- **Built-in hard disk controller**
- **5MB motherboard RAM capacity**
- **Low base price**

AVAILABILITY

Immediate; 486 upgrade scheduled for November

PRICING

$1495 to $4490

Advanced Logic Research

Reader service no. 751

The PowerCache 4, on the other hand, offers sterling accommodations for the 486. It leaves us yearning for software to catch up with hardware. After all, what good are intelligent peripherals if they're running the same dumb DOS applications? In a couple of years, all that power may go to a multitasking environment with a graphic user interface that reaches out of the screen and shakes your hand. In the meantime, a true 486 like the PowerCache 4 is meant to be shared—as a multiuser host or as a network server.

Eric Knorr is a senior editor for PC World.

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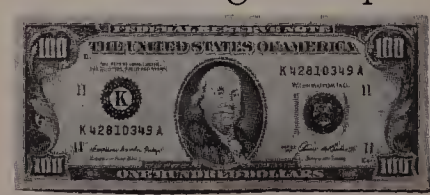

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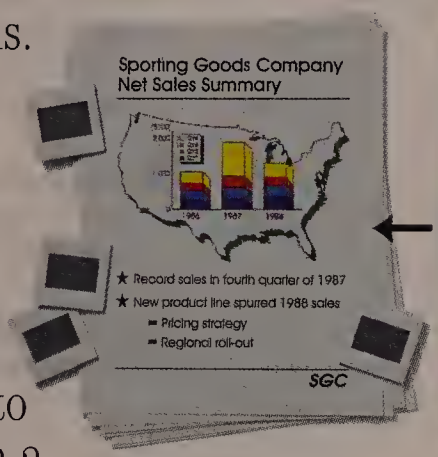

Presentations

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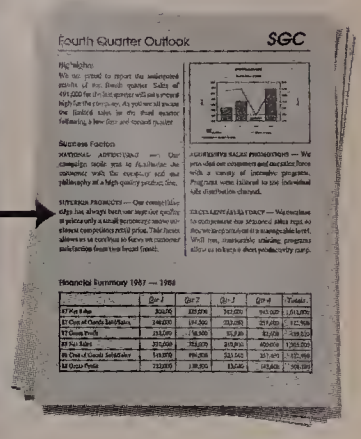

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if you purchase **both** Freelance Plus and Manuscript and send in both Proof of Purchase coupons and sales receipts.) To qualify, you must purchase the full retail version of Lotus Freelance Plus 3.0 (or 3.01) or Manuscript 2.1 from a purchases are not eligible. **InfoWorld*, April 3, 1989; *PC Week*, July 10, 1989. **For more information about the "Perfect Fit" program and how Freelance Plus and Manuscript work with the new Lotus 1-2-3, call 1-800-343-5414.

PRODUCT OUTLOOK

INSIDE PRODUCT OUTLOOK

71 **ALR FlexCache 33/386Z, FlexCache 33/386**
From ALR, a pair of 33-MHz 386 speedsters—a desktop bargain and a high-powered tower.

71 **Expert Mouse**
Get mouselike functionality in a trackball, plus pinpoint cursor control.

72 **Finesse**
Typeset reports and other short documents with Logitech's *GEM*-based desktop publisher.

72 **Epson LQ-510, LX-810**
Same old prices but a raft of new features for Epson's popular 80-column printers.

74 **Amstrad PC2386, PC2286**
You don't get a fancy label with either of Amstrad's budget-minded systems—just everything you need to start working without further ado.

74 **HotShot Presents**
Get into electronic show biz with a presentation graphics tool that lets you control the slides.

76 **Project Outlook**
The *PROMIS* project management system joins *Windows'* graphic user interface.

76 **Tandon 386/33**
With up to 660MB of hard disk available, Tandon's system can satisfy the hungriest applications.

78 **IRMA 3 Convertible**
The successor to DCA's micro-to-mainframe board is fluent in both Micro Channel and ISA.

78 **WealthBuilder**
Import financial data from *Managing Your Money* and *Quicken*, then analyze it.

80 **Proteus Pro-Pac, Sysgen Maxi RD45**
You *can* take it with you—lots of it—with removable disks from two manufacturers.

UPDATE

80 **Open Systems Accounting Software 4.0, Harmony 2.2**
Accounting package updates give you easy access to management data.

82 **Andrew Tobias' Managing Your Money 6.0**
Pay bills electronically via the Federal Reserve.

84 **DacEasy Accounting 4.0**
Version 4.0 responds to user feedback by adding an interface with mouse support and report graphics.

84 **Advanced Revelation 2.0**
Read and modify files across data formats.

ALR squeezes seven slots into its small-footprint FlexCache 33/386Z (left), while its full-size FlexCache 33/386 (right) has eight slots and expands to 16MB of CPU-speed memory.

ALR FlexCache 33/386Z, FlexCache 33/386

The 33-MHz Option: When You Feel the Need for Speed

Now that the 386 CPU's top cruising speed has been pushed to 33 MHz, Advanced Logic Research—always on the cutting edge—has filled out its FlexCache system family so you can go with the flow in style or in economy class.

At $3995 for a floppy-only, monitorless Model 1, the FlexCache 33/386Z is a bargain-priced performer that won't crowd your desk. At the other end of the spectrum, the full-size FlexCache 33/386 costs a hefty $15,990 by the time you add all the extras, but it's a high-powered workhorse ready to shoulder the heaviest engineering or file-server duties.

The latest addition to ALR's small-footprint Z-series, the 33/386Z has seven slots (one 32-bit, five 8/16-bit, and one 8-bit) that fit snugly in a 17-by-16-by-6-inch chassis. A 3½-inch, 1.44MB floppy is standard, and the machine supports an additional internal 3½-inch hard disk drive and two externally accessible 5¼-inch devices.

The 33/386Z comes standard with 1MB of 32-bit, 80ns RAM, expandable to 2MB on the system board, plus sockets for both Intel 80387 and Weitek 3167 math coprocessors. The CPU is backed by 32K of 25ns static cache RAM and an Intel 82385 cache controller.

The optional FlexMem memory card enables you to upgrade to 15MB by adding combinations of 1MB and 4MB memory modules. The FlexMem memory lists for $549 with 1MB RAM; 1MB modules cost $499 and 4MB modules cost $1499.

In addition to the floppy-only Model 1, you can configure the 33/386Z with various combinations of graphics adapters, monitors, and hard drives for as much as $9595.

The FlexCache 33/386 features the same coprocessor configuration as the 33/386Z but comes as a tower with eight expansion slots (seven 8/16 bit and one 8 bit), a 1.2MB 5¼-inch floppy, and a 200-watt power supply. It has 2MB of 60ns RAM expandable to 16MB on the motherboard, and its 33-MHz CPU is backed by a proprietary cache controller driving a 64-bit cache bus and 128K of 25ns static cache RAM.

The FlexCache 33/386 comes in four models ranging in price from $9990 to $15,990, depending on your choice of monitor, graphics adapter, and hard disk. Advanced Logic Research, 9401 Jeronimo, Irvine, CA 92718; 800/444-4257, 714/581-6770. —*Wes Nihei*

Reader service no. 610

Expert Mouse

Mini-Mouse Is on Track

Expert Mouse, a space-saving trackball, replaces a mouse.

Mice are nice for the growing roster of click-and-drag software, but the typical electronic rodent requires more room to roam than the average cluttered desk provides. Kensington Microware solves the problem for industry-standard PCs and IBM PS/2s by wedding mouselike functionality to a trackball.

The Expert Mouse takes about a third the desk space of a mouse pad. In the center of its 4½-by-5¾-inch plastic box rests a billiard ball–size roller. Instead of pushing a mouse around when you want to move your cursor, you spin the roller with your finger.

This trackball is a popular replacement for the mouse bundled with Macintoshes. One reason is precision. Although it offers the same 200-cpi resolution as other mice, advocates say, the trackball gives pinpoint control of the cursor because it registers the movements of a single finger, rather than the larger movements of hand and arm. Acceleration software senses how fast you spin the ball and adjusts on-screen response accordingly.

Expert Mouse has the same profile as Kensington's Turbo Mouse for the Mac but recognizes the PC's distinction between right and left buttons. Also, lefties can switch the buttons' functions to put the hot key under their dominant thumb.

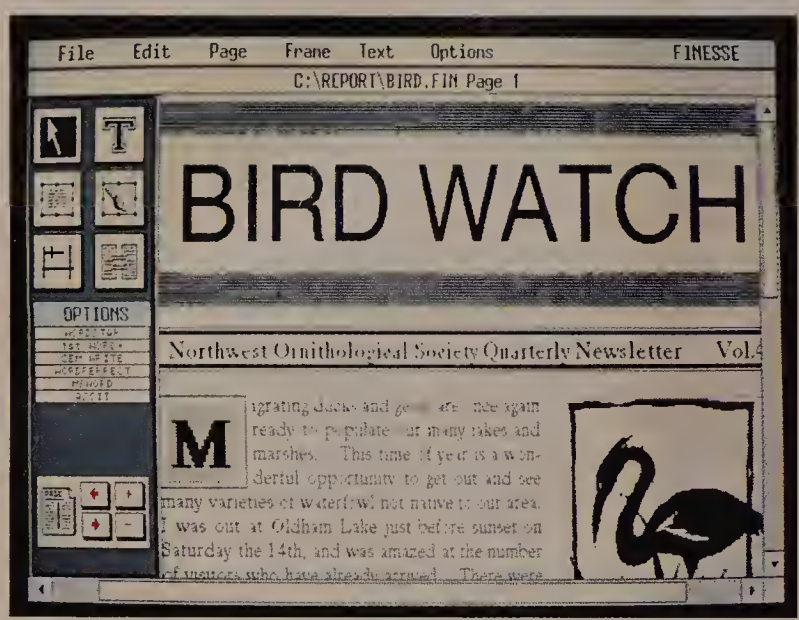
Bundled software supports the Microsoft Mouse standard and allows you to emulate three buttons with the Expert Mouse's pair. Pop-up menus let you set up and use the trackball with programs that don't normally support mice, such as *1-2-3* and *WordPerfect*.

The Expert Mouse, which retails for $169.95, includes a two-button trackball, an 8-foot cable, and software that ships on 5¼- and 3½-inch disks. Kensington Microware Ltd., 251 Park Ave. S, New York, NY 10010; 800/535-4242, 212/475-5200. —*Mark Henricks*

Reader service no. 611

Finesse

Ventura Gives You Stress? Lighten Up With Finesse



Finesse offers Ventura-like pulldown menus, icons, and a frame-based page-layout metaphor at a low price.

Desktop publishing professionals have welcomed every *Ventura Publisher* and *PageMaker* upgrade with cries of "More!" But the occasional publisher—who only needs to put a quick gloss on reports, memos, and other short documents—rarely has the time to master such complex programs. Logitech's new *GEM*-based *Finesse* offers a less bewildering array of features but still produces typeset, multicolumn, graphics-laden documents—and it's half *Ventura*'s price.

Finesse has *Ventura*'s look, with similar pulldown menus, a panel of icon tools, and frame-based page layout. The program's 16-page-per-document limit makes it unsuitable for long manuscripts, catalogs, or books. But you can choose from four page sizes (letter, legal, A4, and A5) in portrait or landscape orientation; use a grid to adjust margins and align objects and text; and create right- and left-hand master pages.

Finesse allows simple text editing, including search and replace, and lets you import ASCII text or native format *Word*, *WordPerfect*, and *GEM* documents. The program flows text automatically around graphics and text frames, although flowing text from page to page requires an additional step using a chaining tool. *Finesse* doesn't skimp when it comes to type: It comes bundled with Bitstream's *Fontware* font-generation program and five typeface outlines—Swiss, Dutch, Courier, Charter, and Symbol—with hundreds more available through Bitstream dealers.

Finesse's graphic import capabilities are limited to a few popular formats: .PCX, TIF, .IMG, and .GEM. You place an image file in a graphics frame and choose between full-size and scaled versions with frame control points that let you further scale or crop images. Like competing publishing packages, *Finesse* comes with a modest collection of useful clip art in TIF format, but the program also incorporates a built-in interface to Logitech's $339 ScanMan hand scanner.

The suggested price for *Finesse* is $199. The program requires 640K, a hard disk, a graphics display, and DOS 2.1 or a later version (the included *Fontware* program requires DOS 3.1 or a later version); a mouse is recommended. Logitech Inc., 6505 Kaiser Dr., Fremont, CA 94555; 800/231-7717, 800/552-8885 California. —*Scott Spanbauer*

Reader service no. 612

Epson LQ-510, LX-810

Following in Some Big Footprints

Epson's LQ-500 and LX-800 80-column printers have ranked among the most popular PC peripherals, so replacing them is a big challenge. Epson's newest, the 24-pin LQ-510 and the 9-pin LX-810, represent more of the same good thing at killer prices.

The LQ-510's improvements over the LQ-500 include paper parking, LED front-panel controls, and improved resolution. If you print on a mix of continuous-form and single-sheet paper, Epson's SmartPark paper-handling feature greatly eases your task with single-button paper switching.

SelecType front-panel controls with LED indicators bring clarity to font and paper-handling changes. You get greater clarity in graphics as well, thanks to the LQ-510's 360 by 360 resolution, twice the old model's 360 by 180. Text print speed still ranges from 180 cps in draft elite mode to 50 cps for letter-quality pica characters.

The 80-column LX-810 adds the SmartPark and SelecType features, plus a nifty SuperDraft mode that churns out a speedy 200 cps—an 11-cps improvement over the LX-800's top gear. And you won't tie up your computer as long waiting for the printer, because Epson has bumped up the input buffer by a third to 4K.

The best news about the Epson replacements is that suggested retail prices have not changed. The LQ-510 retails for $529, the LX-810 for $299. Options for both include a $129 cut-sheet feeder and a $59 pull tractor. LQ-510 font modules are $59 apiece. Epson America, 23530 Hawthorne Blvd., Torrance, CA 90505; 800/922-8911. —*Mark Henricks*

Reader service no. 614

You know exactly what your company wants in a color printer.

Amstrad PC2386, PC2286

Off-the-Rack Computing for the Budget Conscious

Amstrad gives you its 20-MHz 386-based PC2386 (left) or 12-MHz 286-based PC2286 (right) with plenty of extras at competitive prices.

Amstrad takes a cue from the ready-to-wear haberdasher with its PC2286 and PC2386 systems. Neither is tailored to stop traffic, but you can outfit yourself in one stop. Both deliver everything you need to get up and running immediately, even if you have to sacrifice the fancy label.

If you're feeling upscale, Amstrad's PC2386 offers a 20-MHz Intel 80386 processor, fed by 64K of 32ns cache memory and an impressive 4MB of standard system memory that can be padded to 16MB on the motherboard. Accessories include a socket for an Intel 80387 coprocessor, DOS 4.0, and *Microsoft Windows/386*.

If your wallet dictates a less expensive cut, Amstrad proposes the PC2286, with a 12-MHz Intel 80286 and 1MB of memory, expandable to 4MB on the system board. You also get the 286 version of *Windows* and support for the 80287 math chip.

The motherboard for each system houses parallel and serial interfaces, hard/floppy drive controllers, and a VGA video adapter, so all four 8/16-bit expansion slots and one 8-bit slot are free for accessory boards. The side of each cabinet holds an adapter for an external 5¼-inch floppy or a streaming tape drive—handy if you need to back up or update several machines with one archive drive. The basic system package also includes a 1.44MB, 3½-inch floppy, a 101-key keyboard, and a Microsoft Mouse.

The low-end PC2286 comes with two floppies for $2099 retail. The price rises to $2699 with a 28ms 40MB hard drive. The single-floppy PC2386 starts at $3995. A paper-white VGA monitor is available for $249. For $499, you get a 14-inch color VGA display. Dealers add hard drives. Amstrad Inc., 1915 Westridge Dr., Irving, TX 75038; 800/999-0174. —*Mark Henricks*

Reader service no. 613

HotShot Presents

Interactive Presentations Keep the Show Rolling

The show must go on. But when you're putting on a desktop presentation for a sales meeting and the CEO asks you to repeat a frame, many electronic slide-show packages won't let you.

HotShot Presents will. With this presentation graphics package, you can stop, forward, and reverse your presentation while it's in progress, using keyboard, mouse, or remote control. Alternatively, the program can run the whole thing for you at a preset pace, dazzling your audience with 11 transition effects including iris, diagonal, blinds, rain, and weave wipes. You can switch from self-running to interactive mode at any time.

Even complicated fades, wipes, and other effects happen quickly, while your audience is still awake. And it doesn't matter whether you're running a 35mm slide machine, video projector, overhead projector, or even one of the new LCD projection panels.

HotShot Presents is actually more of a presentation management tool than a creator of artful graphics. One notable shortcoming is the inability to make charts from scratch. Instead, you must make do with extensive importing capabilities. You can bring in graphics from *1-2-3*, *AutoCAD*, *MacPaint*, PCS, TIF, WPG, CGM, or HPGL formats.

But creative types aren't left entirely out in the cold. The bidirectional outliner automatically transfers typed words onto slides and, conversely, automatically creates an outline when you type directly onto the slide file. To further speed and smooth production, you can make templates for standard slide formats.

The $349 program requires DOS 2.1 or a later version, 640K, and a hard disk. It supports CGA through VGA graphics with the exception of the 256-color VGA mode, which is not widely supported by output or projection devices anyway. Most popular laser printers are supported, as well as Polaroid Palette slide makers. Symsoft Corp., 444 First St., Los Altos, CA 94022; 800/344-0160, 415/941-1552. —*Mark Henricks*

Reader service no. 615

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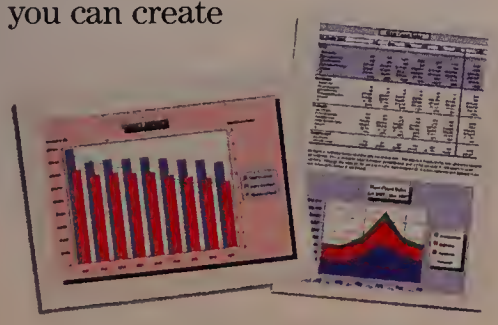

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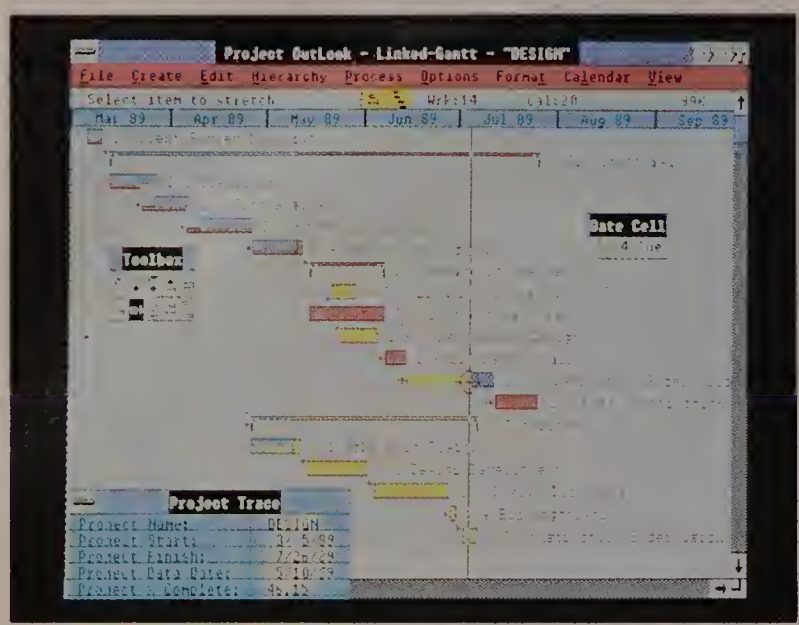
Project Outlook

Windows Simplify Project Scheduling



Project Outlook uses the Windows interface to help simplify project management analysis—as in the Gantt chart shown here.

Like projects themselves, project scheduling packages can quickly strand you in a thicket of seemingly unrelated details. Strategic Software Planning helps you escape this morass with a promising new hybrid, *Project Outlook*, that marries a stripped-down version of its $4300 *PROMIS* project management system to the *Microsoft Windows* graphic user interface.

You create a project plan in *Project Outlook* in outline format with automatic numbering, or in Gantt or bar charts with automatic task dependency links. You can display those links in what other vendors call a time-scaled network diagram.

Project Outlook takes great advantage of *Windows* to let you see almost everything on a single screen, rather than descending through a series of screens to enter data. Choose the type of view you want (for example, Gantt format) and modify it by displaying connections between tasks and other task-related data. You then can save that view for use in different projects or create a report by simply printing what appears on the screen—dumping a single window or the whole project to the printer.

The *Windows* clipboard lets you transfer a section of the schedule to other *Windows* applications. You also can export data to a spreadsheet like *Microsoft Excel* or to SSP's *PROMIS* mother ship.

Project Outlook falls short of becoming everyone's project manager by relying too much on *Windows* to solve project scheduling's traditional ease-of-use problems. It lacks help text, and while *Windows* puts everything on one screen, you still may have to click through numerous pulldown menus trying to find that feature you know you just saw. Anyone unfamiliar with the critical-path method needs to keep the manual close at hand. And the program does scheduling only—for resource or cost features, you must turn to the full-scale *PROMIS*.

The *Windows* environment also creates a memory issue. *Project Outlook* can load only 150 to 200 tasks before it slows to the pace of chilled molasses; you can run it in 640K RAM, but 2MB of expanded memory is recommended. You need at least a 286-based machine and a minimum 1MB of hard disk space. The $495 retail price includes a runtime copy of *Windows*. Strategic Software Planning Corp., 1 Athenaeum St., Riverview II, 15th fl., Cambridge, MA 02142-9990; 800/777-3282, 617/577-8800. —*Mark Burgess*

Reader service no. 618

Tandon 386/33

Speed for Show, Data to Go

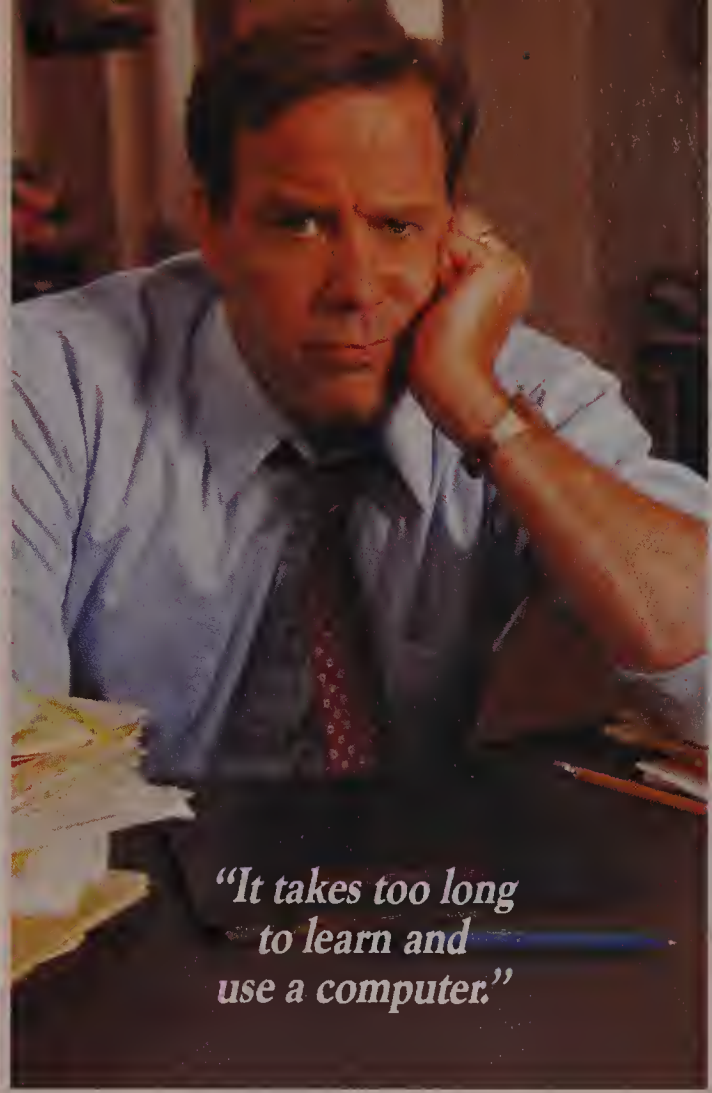
Since 33-MHz 386s typically are enlisted for data base, accounting, CAD, or other power-user tasks, they quickly gobble up storage space; 40MB is a mere tidbit for most applications. But with up to 660MB of hard disk available, Tandon's 386/33 can satisfy even the most voracious appetite. And if you prefer data to go, Tandon's Personal Data Pac 30MB and 40MB removable disks give you carry-out options.

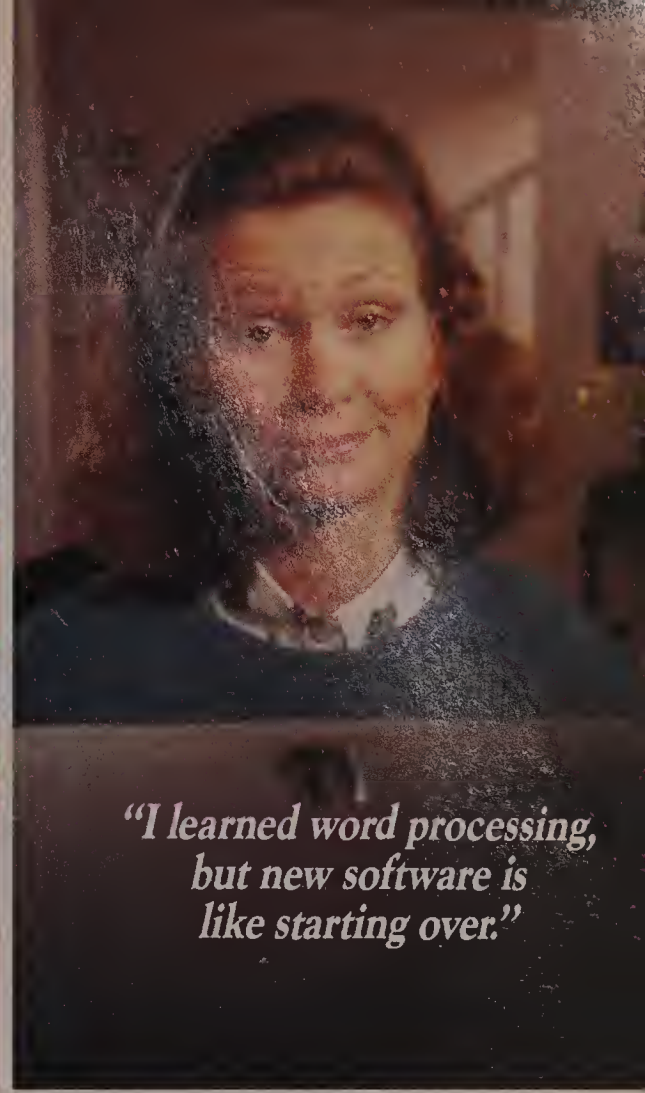
The 386/33 comes in a floppy-only version or with 110MB, 330MB, or 660MB hard disks. Although standard system memory is a mere 1MB of 80ns 32-bit RAM, the 386/33's motherboard can handle a total of 8MB in 1MB SIMMs. An optional daughterboard lets you beef up system RAM to 16MB total. The motherboard also holds sockets for both Intel 80387 and Weitek 3167 math coprocessors. The 386/33 machine uses shadow RAM and 64K of 25ns cache memory to boost performance further.

The system offers a standard complement of eight slots—two 8-bit, five 8/16-bit, and one 32-bit. However, the 386/33 can handle five half-height devices or three devices with a Data Pac. Other standard features include a 1.2MB 5¼-inch floppy drive, a hard disk controller, a parallel port, a serial port, a 190-watt power supply, and DOS 3.3.

The floppy-only Tandon 386/33 lists for $3361. A 386/33 with a 110MB hard disk costs $4222, and the 330MB model costs $4967. The Personal Data Pac costs $406, plus $300 for the 30MB removable disk drive or $377 for the 40MB version. Display choices include an 8-bit VGA card for $254 and a 16-bit VGA card for $286. Tandon Corp., 301 Science Dr., Moorpark, CA 93021; 805/523-0340. —*Wes Nihei*

Reader service no. 616





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IRMA 3 Convertible

Micro-to-Mainframe Board

No need to stock 3270 terminal emulation boards for both Micro Channel and Industry Standard Architecture PCs—the IRMA 3 Convertible supports both.

While IBM's Micro Channel Architecture is gaining ground, Industry Standard Architecture isn't going away, so add-on boards that fit both buses may become common. This versatility will be particularly valuable in memory boards and other options that often migrate from one machine to another, but it's out first in the IRMA 3 Convertible.

IRMA 3, the successor to the world's most popular micro-to-mainframe board, incorporates Micro Channel connections on one edge and ISA connections for a 16-bit "AT" slot on the other. Whichever bus you take, you'll have hardware support for a wide range of IBM 3270 terminal emulation software from IBM or DCA.

With the IRMA 3, your company doesn't have to standardize on a bus architecture. Switching between ISA and Micro Channel requires little more than inserting the appropriate side in the appropriate slot. The connectors activate automatically, and mounting brackets for both types of machines are included. The card also offers both a coaxial cable plug and a twisted-pair RJ-11 jack.

IRMA 3 Convertible is backward-compatible with the whole line of emulation and file transfer software developed by DCA for its venerable IRMA line, giving you access to IBM mainframe data as if through a 3278 or 3279 terminal. It also supports *OS/2 Extended Edition*, *3270 PC Workstation*, and other IBM emulation programs. And it does this in the background, letting you use your PC as a PC while displaying and sending mainframe files.

The $695 IRMA 3 Convertible requires DOS 2.1 or a later version or OS/2, depending on the requirements of your emulation or file transfer program. Digital Communications Assoc., 1000 Alderman Dr., Alpharetta, GA 30201; 800/241-4762, 404/442-4500. —*Mark Henricks*

Reader service no. 617

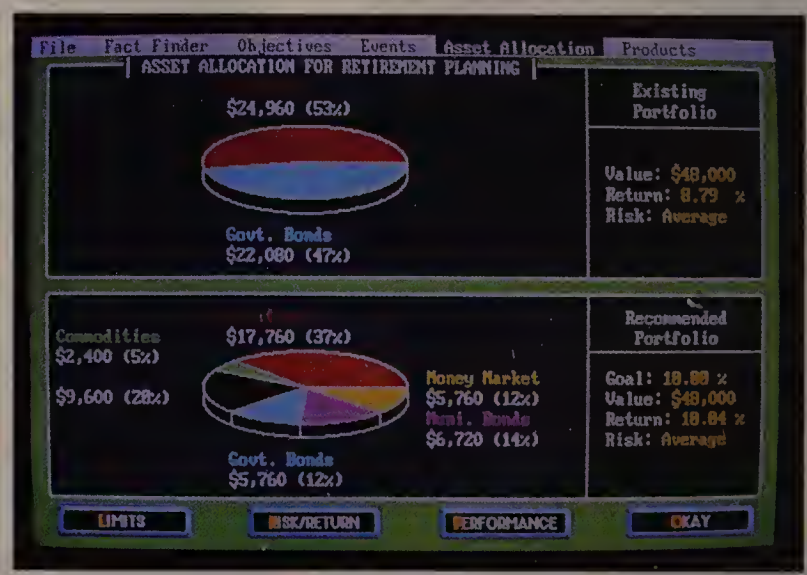
WealthBuilder

Stacking It Up

WealthBuilder from Reality Technologies brings investment analysis to personal asset management. The program imports your budget, tax, insurance, and portfolio data from *Andrew Tobias' Managing Your Money* and Intuit's *Quicken*. Then, applying an asset allocation analysis technique, it suggests ways to meet your goals for retirement, home ownership, schooling, or that new boat.

The package comes with 600 pages of hypertext tutorials introducing the novice to financial nomenclature and concepts. Once you get the lingo straight and import your financial data, you set your personal standards for risk and reward. The program then recommends specific asset categories for your funds, using historical records for such indicators as stocks, bonds, mutual funds, interest rates, and commodities. Quarterly updates of mutual fund data cost $99 a year.

Line-sensitive help guides you through the projections, and pie and bar graphs compare your strategy to the estimated results of other approaches. Other printed reports summarize your balance sheet, budget, savings, financial objectives and asset allocations and the performance of selected mutual funds and list suggestions for filing your taxes.



WealthBuilder brings graphics to the task of tracking and managing your investments and other personal assets.

You can operate *WealthBuilder* via mouse or keyboard. The package retails for $249.95 and requires DOS 2.0 or a later version, 512K, and a hard disk. Reality Technologies, 3624 Market St., Philadelphia, PA 19104; 800/346-2024. —*Mark Henricks*

Reader service no. 619

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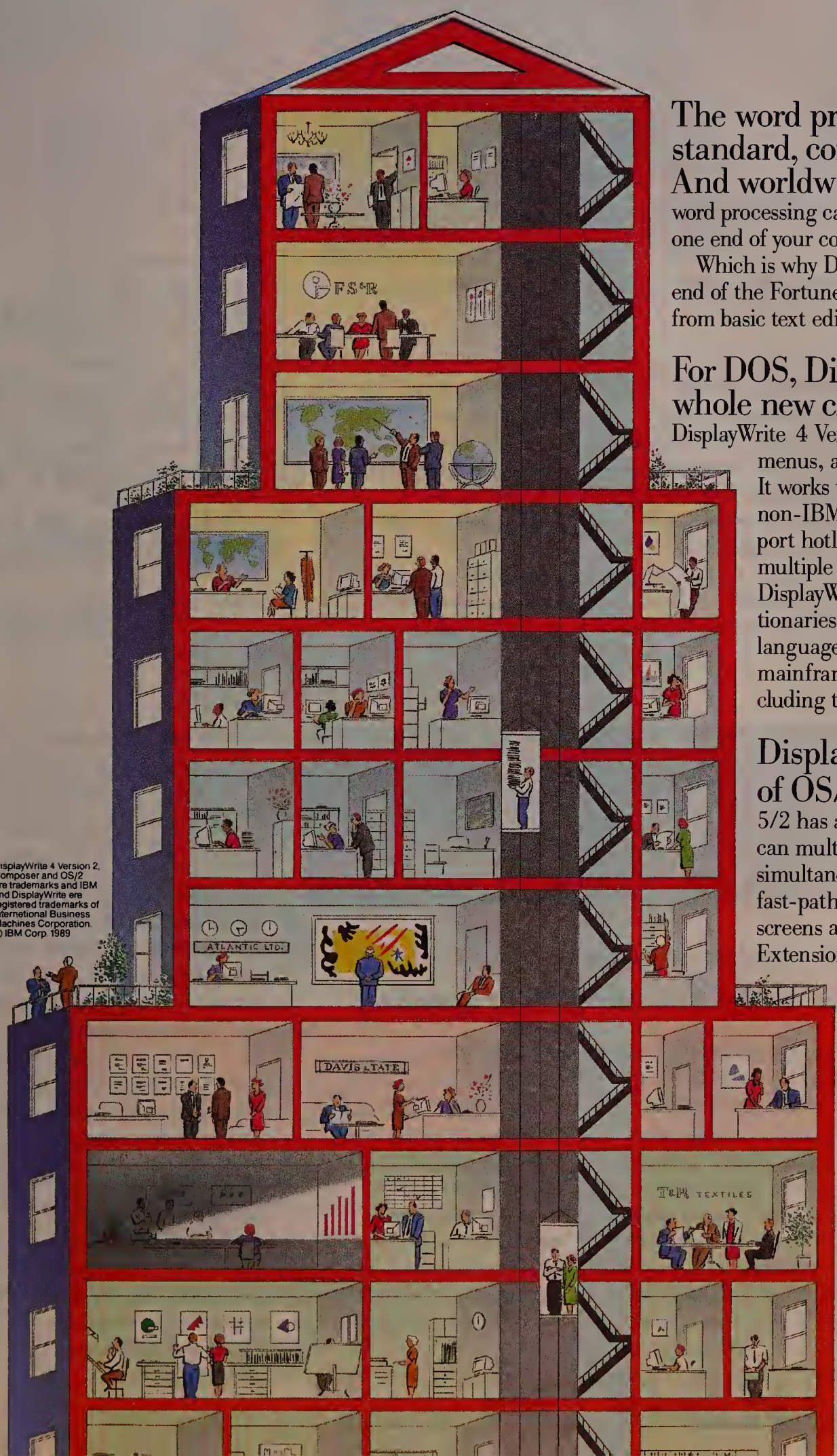

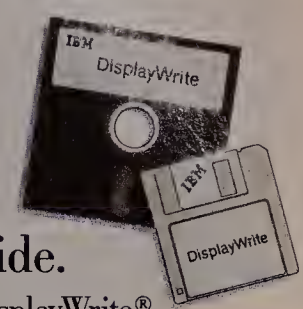

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Proteus Pro-Pac, Sysgen Maxi RD45

Removable Disks Can Pack 150MB in a Briefcase

Removable storage systems from Proteus (left) and Sysgen (right) let you pull as much as 150MB of data out of your machine for transport or safekeeping.

Like their fixed-disk cousins, removable disks are reaching capacities undreamed of mere months ago. Media mavens Proteus Technology and Sysgen have introduced several disks that let you transfer up to 150MB from your machine into a briefcase, a safe, or an off-site computer with the same hard drive housings.

Proteus's Pro-Pac line is a series of removable disks, while Sysgen's Maxi RD45 is a 45MB Winchester disk with a replaceable cartridge. Each manufacturer boasts a speedy 1:1 interleave and 28ms or faster access speeds.

The Pro-Pac consists of an enclosed half-height frame that screw-mounts in a drive bay, and a drive. Capacities and disk-access speeds include a 28ms 20MB drive for $685, a 22ms 45MB drive for $885, a 19ms 80MB drive for $1265, a 19ms 100MB drive for $1485, and a 16ms 150MB drive for $2595. You can interchange the 20MB and 45MB disks once the frame is installed; ditto for the 80MB, 100MB, and 150MB disks. Each disk is bootable and designed for 80386- and 80286-based ATs and compatibles. Each disk is preformatted and runs under DOS 3.3 or a later version. Proteus Technology Corp., 75 Kingsland Ave., Clifton, NJ 07014; 800/782-8387 (orders), 201/614-7000. —*Mike Hogan*

Reader service no. 620

Sysgen's Maxi RD45 is available in external and internal models for the PC, XT, AT, PS/2, and compatibles. The 5¼-inch disk is a sputtered graphite, Teflon-coated platter that sells for $175 and is said to hold up over the long haul better than cartridges with flexible plastic media.

When you buy the internal subsystem for $1325 or the external for $1625, you also need the PC bus interface kit for an additional $195 or the Micro Channel kit for $250. Occupying a full-size slot, each SCSI device lets you daisy-chain other devices to it. The bootable RD45 runs under DOS 3.0 or a later version. External and internal models have their own power supplies. Sysgen, Inc., 556 Gibraltar Dr., Milpitas, CA 95035; 800/821-2151 (information), 408/263-4411. —*Glenn Grant*

Reader service no. 621

UPDATE

Open Systems Accounting Software 4.0, Harmony 2.2

Get to the Bottom of Your Numbers

Accounting packages are evolving from mere number crunchers into tools that provide timely, indispensable management information. Two new releases from Open Systems deliver a great deal of this new functionality.

You can't use information you can't reach, and unlike most accounting products *Open Systems Accounting Software (OSAS) 4.0* allows users to load files into different windows and switch back and forth easily between them. Other enhancements to the user interface include user-defined function keys, a pop-up calculator, context-sensitive help, and the ability to print reports to disk, screen, and printer.

The *OSAS* revision has greater speed and more features. The general ledger, for example, includes trial-balance worksheets and simplifies the consolidation of general ledger reports. The accounts receivable module calculates sales commissions and automatically generates monthly invoices. Accounts payable features 1099 magnetic media tax reporting, purchase history reporting, and other enhancements.

Harmony, the company's midrange accounting product, also has been fine-tuned in version 2.2. *(see Open Systems, Harmony, p. 82)*

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Finding the right VGA card can be a long and confusing journey, so follow the name you can trust. Hercules, the company that defined PC graphics, brings you the Hercules VGA Card. At just $299,* it's everything you need to enter the kingdom of color.

Compatible. The Hercules VGA Card delivers all 17 IBM standard video modes so your EGA and CGA software will be at home. And it will work with any color or monochrome analog video VGA monitor.

Simple. The Hercules VGA Card is easy to install and use with no switches, jumpers or custom software drivers. And since the Hercules VGA Card is faithful to the VGA standard, you'll use future software without needing extra drivers.

Beautiful. Over 256,000 colors will brighten your workday routine. And the Hercules VGA Card's 1/1 aspect ratio makes a square look like a square and a circle look like a circle.

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There's no place like

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Circle 83 on reader service card

Open Systems, Harmony

(continued from p. 80)

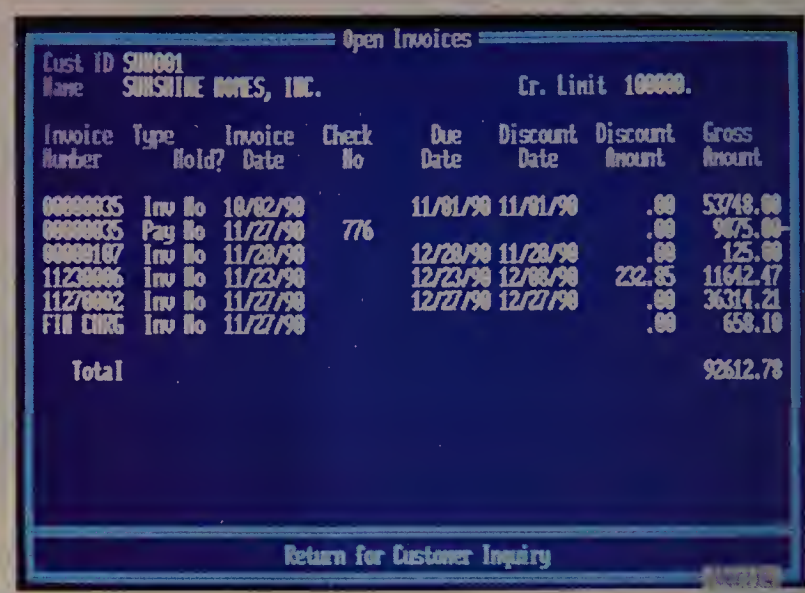
The general ledger, for instance, offers more financial reporting options such as consolidated financial statements for multiple businesses and a statement-of-changes worksheet for cash flow calculations.

Harmony's system manager provides improved management capabilities such as easier communication between modules, easy exits to DOS, and a built-in multiuser option.

The *OSAS* single-user resource manager costs $295; the network version is $995. General ledger, accounts receivable, accounts payable, inventory, and payroll list are $795 each. Fixed assets, job cost, and purchase order modules cost $695; the report writer is $595. *OSAS* requires DOS 2.0 or a later version, 640K, and a 20MB hard disk. Upgrades cost $195 per module; discounts are available for users who bought version 3.2 after May 1, 1989.

Harmony costs $99 for the single-user system manager; the network version is $599. General ledger, accounts receivable, and accounts payable sell for $399 each. Payroll, inventory, and order entry cost $599 each. The report writer is $199; the import/export facility, $79; the word processor and spreadsheet, $99 each. *Harmony 2.2* requires DOS 2.1 to 3.3, 512K, and a hard disk. The upgrade costs $99.95 per main module and $49.95 for productivity applications. Open Systems, 6477 City West Pkwy., Eden Prairie, MN 55344; 800/328-2276, 612/829-0011. —*Anita Amirrezvani*

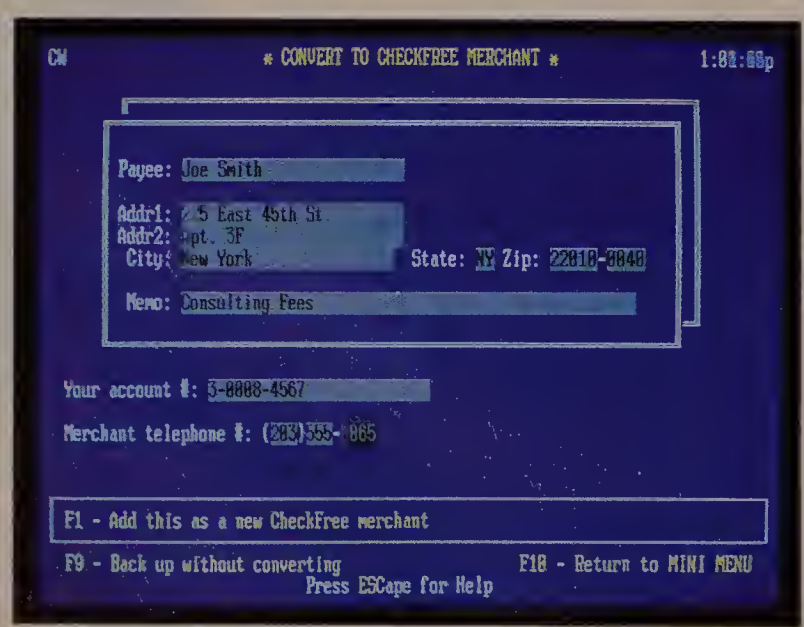
Reader service no. 622



New file structures in OSAS 4.0 allow quick access to account information such as invoice number, due date, check number, discounts, and credit limit.

Andrew Tobias' Managing Your Money 6.0

Pay Bills at the Last Minute Electronically



The new version of Managing Your Money keeps all the vital information about vendors you pay regularly.

Managing money is one thing. Managing electronic payments is another—and that's the major improvement in the latest release of *Andrew Tobias' Managing Your Money.*

Last year's version added an electronic-funds-transfer facility through Chase Manhattan Bank. *Managing Your Money 6.0* replaces that clunky module with an Ohio-based electronic payment service called CheckFree. With it, you can use your modem to tap your bank accounts directly through the Federal Reserve System. CheckFree charges $9 a month, for up to 20 transactions, with a nominal additional fee for more transactions.

You select a new electronic payments menu option from the *Managing Your Money* menu and specify whom to pay, how much, and when. The program auto-dials a payment processing center, which settles the bill electronically through the Fed's automated clearinghouse. CheckFree even sends printed checks to merchants who aren't set up to handle electronic payments.

No need to pay bills early to allow for postal delay; keep your cash socked away in interest-bearing accounts until the very last minute. The service requires a Hayes-compatible modem as well as the standard 256K of RAM; DOS 2.0 or a later version is required for *Managing Your Money.*

Version 6.0 costs the same old $219.98, including CheckFree. Registered users can upgrade at $49.95. MECA Ventures, 355 Riverside Ave., Westport, CT 06880; 203/222-9150. —*Mark Henricks*

Reader service no. 655

5-9849.

FOR SALE

synchronous modems. 1 ear old. Will sacrifice. Send quiries to Ronocron, Inc. PMIS Dept., 863 W. 40th St, lew York, NY 11112. Attn. bert Kushner.

EXECUTIVE POSITION AVAILABLE. DPMIS DEPT.

International Industrial Corporation. Must have experience in cost efficiency. Call 555-3450.

need. Business or recreational. Call SoftLots. 555-4647.

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150 Mickey Modems. CHEAP!!! They must go! Call mornings. 555-9348.

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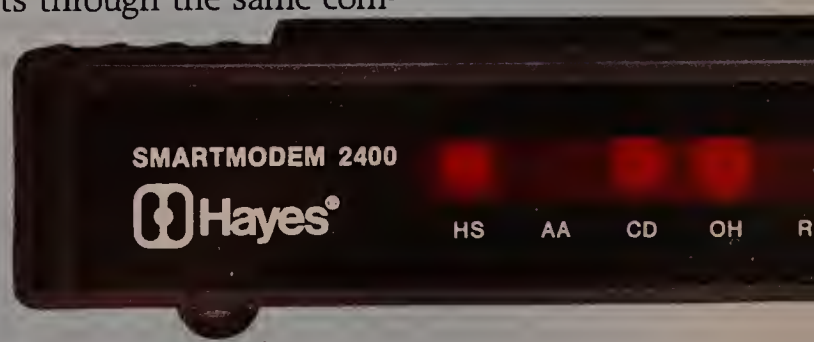
Computer games for models. Original software. Call nights. 555-3479.

SINCE WE INTRODUCED AUTOSYNC, WE'VE SEEN A LOT OF ADS FOR OUR COMPETITORS.

Our best advice is that you ignore them all and get a Hayes modem with AutoSync instead. That way your PC can automatically talk synchronously* to mainframes or asynchronously to other PCs and hosts through the same communications port on your computer.



You see, AutoSync is built into Hayes 2400 bps, and higher-speed, stand-alone or board modems and all Hayes V-series™ modems. So you won't have to rely on synchronous adapter cards, protocol converters and other impressive sounding equipment that can cost so much money. AutoSync is even a standard feature in the Hayes modem available in the Zenith® TurbosPort™ laptop, so you can communicate with the office mainframe from almost anywhere.

We think you'll agree that getting a Hayes modem with AutoSync is a lot better than wasting money on needless equipment. Or needless advertising.

Hayes®

For your nearest Hayes Advanced Systems Dealer, call 800-635-1225. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348.

*Using software which incorporates the Hayes Synchronous Driver (HSD) purchased from CQ Computer Communications, Digital Communications Associates, or Network Software Associates.

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Circle 343 on reader service card

IN THE BATTLE FOR 286 LAPTOP POWER, SHARP IS THE CLEAR WINNER

INTRODUCING THE SHARP PC-5541.

Now, Sharp technology elevates the 286 laptop to a new dimension of power, speed and display resolution, with the PC-5541.

HIGH RESOLUTION VGA PAGE-WHITE DISPLAY.

The PC-5541 features VGA resolution on a page-white, backlit, double-super-twist liquid crystal display. Developed and produced by Sharp, it boasts an industry leading 640 x 480 resolution with 16 shades of gray. All of which help to make the PC-5541 the unsurpassed 286 laptop.

FAST 40 MB HARD DRIVE.

The Sharp PC-5541 beats the competition with a fast (25ms) 40 MB hard drive. Add that to its 12 MHz clock speed and internal RAM expandable to 3.6 megabytes, and you've got a 286 laptop with an unbeatable combination of power and speed.

EXTENDED BATTERY LIFE.

The PC-5541 comes standard with an internal 2.5 hour battery. Or for use on those long trips, get up to an impressive 5.5 hours of operation with an optional add-on battery "slice". Or it can be plugged into any AC outlet.

The PC-5541 also boasts a full-featured, step-sculptured keyboard, which greatly enhances the machine's ease of use and user comfort.

For unsurpassed laptop power, speed, and display quality, there's only one choice. Sharp.

For more details about the winning laptop, just call 1-800-BE-SHARP.

SHARP

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"Is there something we missed?"

Is there anything missing in the ACCEL-500 24-pin dot matrix printer?

Not performance. The ACCEL-500 can zoom through drafts at 480 cps. Print charts and graphs in dazzling color. And combine letter quality with high resolution color graphics.

Not versatility. The ACCEL-500 is compatible with most popular printers. So it's equally at home on Macintosh® and IBM®-compatible PCs. There's a paper-handling option for every office application, too.

Not convenience. The ACCEL-500's innovative Select-Dial™ makes paper handling a snap. And plug-in Intelli-Cards™ add fonts and printer emulations instantly.

Not reliability. The ACCEL-500 is a 'round-the-clock workhorse that takes even the most demanding workload in stride.

And certainly not value. The ACCEL-500 is priced below leading printer brands that offer far less capability.

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Circle 5 on reader service card

33 MHz: Power for the Impatient

Ultrafast 386 systems from AST, Compaq, and Zenith are shipping now.

But with 486 machines just around the corner, are they really a smart buy?

TJ Byers and Eric Knorr

As you read this, the first 486 PCs are about to hit dealer shelves and stand the current notion of PC performance on its ear. So where does that leave 33-MHz 386s?

Compared with its immediate predecessor, the 25-MHz 386 PC, a 33-MHz system doesn't buy you much more usable performance. Though the CPU runs 32 percent faster, our benchmarks of the systems reviewed—the AST Premium 386/33, the Compaq Deskpro 386/33, and the Zenith Z-386/33—reveal that overall speed increase averages only 20 percent. (With a CPU this fast, the speed of the hard disk is often a limiting factor.) Running today's DOS-based business applications, a 25-MHz system can already complete most operations in a flash; the difference between 2 seconds and 1.6 seconds hardly seems worth the extra cash.

The smart move would be to wait until 486 production is in full swing. Not only do 486 systems perform two to three times faster than 386 PCs running at the same clock speed, they should eventually be cheaper to manufacture than 386s; at the least, mass-produced 486 PCs will send 386 system prices plummeting. So if you're locked into a Presentation Manager future and need all the computing power you can get, wait a year. You'll get more bang for the buck, and by then there should be a 32-bit version of OS/2, along with enough Presentation Manager applications to justify the investment.

Only power users who can't wait will find the 20 percent edge worth the money. At the top of the list are CAD/CAE users, who are always desperate for faster number crunching and screen redraws. Next are users determined to set up a UNIX-based multiuser system, where every increase in processing speed can mean a higher acceptable number of users. Anyone looking for a better server, however, might be wise to spend the extra cash on a faster hard disk.

EXECUTIVE SUMMARY

AST Premium 386/33

33-MHz 80386-based computer

BEST BUY

The best and lawest-priced 33-MHz system reviewed, this pawerhouse can support 36MB af CPU-speed RAM. Saan yau'll be able to swap the system's 386 processor baard for a 486, just as you can with IBM's PS/2 Madel 70-A21.

	POOR	FAIR	GOOD	EXCELLENT
CPU-speed RAM				●
Expandability				●
Ergonomic design			●	
Performance				●
Overall value				●

Reader service no. 640

Ravenously power-hungry users will be enticed by AST's Premium 386/33, which is designed to let you swap its 386 CPU card for a 486 one. If you need top-of-the-line 386 performance now and intend to move up to 486 power as soon as it's available, the Premium 386/33 satisfies both needs in one box.

Driven by today's 33-MHz 386 CPUs, both the Premium 386/33 and the Zenith Z-386/33 fall slightly behind the Deskpro 386/33 in our performance tests, but not bya make-or-break margin. The price differences are less subtle.

To help you compare costs, we standardized the configuration of these systems to include 4MB of RAM, a 1.2MB floppy drive, a 320MB ESDI hard disk, a VGA board and VGA color monitor, one parallel and one serial port, a 101-key keyboard, disk-caching software, and DOS.

The Compaq Deskpro 386/33, the AST Premium 386/33, and the Zenith Z-386/33 (left to right in photo) all offer top 386 performance. But only the Premium 386/33 converts to a 486.

JOHN GREENLEIGH

FEATURES EVALUATION

AST Premium: First Among Equals at 33 MHz

These 33-MHz systems only seem identical. A closer look reveals that the AST Premium's low price, high CPU-speed RAM capacity, and easy 486 upgrade set it apart. Compaq's Deskpro 386/33 offers the best slot capacity, but you'll pay a lot for the privilege.

● Yes
○ No
◒ Deficient

	AST Premium 386/33	Compaq Deskpro 386/33	Zenith Z-386/33
Standard features			
Price	$12,439 [1]	$17,147 [1]	$15,497 [2]
CPU	80386	80386	80386
CPU speed	33 MHz	33 MHz	33 MHz
Coprocessor support	387/Weitek	387/Weitek	387/Weitek
Disk-caching software	●	●	●
Built into motherboard			
Parallel port	●	●	● [3]
Serial port	●	●	● [3]
Floppy disk controller	●	○	○
Video adapter	○	●	○
Mouse port	○	●	○
CPU-speed RAM			
Capacity	36M8	16M8	32M8
Expandability			
32-bit expansion slots/ number free	3/2 [4]	1/0	4/3 [4]
8/16-bit expansion slots/number free	3/1	6/4	3/1
8-bit expansion slots/ number free	1/1	1/1	0/0
Half/full-height storage device bays	5/2	4/2 [5]	5/2
300MB or larger hard disk available from maker	●	●	●
Ergonomic design			
Switchless setup	○	○	○
Compact footprint	○	○	○
Complete documentation	●	●	●
Tilt-and-swivel monitor	●	●	●
Front-panel reset button	●	○	○
Front-panel on/off switch	○	●	○

[1] Price based on standard PC World 80386 system configuration: 4MB RAM, 1.2MB floppy, 320MB ESDI hard disk, at least one parallel port, at least one serial port, VGA video board and color monitor, 101-key keyboard, disk-caching software, DOS 3.3.
[2] Same as footnote 1, except with Windows/386 and OS/2.
[3] Built into the bus controller board.
[4] 32-bit slots can be used as 8/16-bit slots when not occupied by a 32-bit board.
[5] 5/2 if third-height drives are used.

AST Premium 386/33

At $12,439 in our standard configuration, the AST Premium 386/33 is far and away the least expensive of the three systems. What's more—as with IBM's PS/2 Model 70-A21—the modified passive backplane design offers an easy upgrade to a 486 CPU via a $2995 replacement processor board, which will purportedly be available this fall (see the sidebar "AST's 486 Upgrade Solution").

The current 386-based processor board fits into one of three 32-bit slots and has sockets for 80387 and Weitek 3167 math coprocessors, along with up to 4MB of RAM. AST offers a special 32-bit memory expansion board with a 16MB capacity, raising the system's CPU-speed RAM maximum to 36MB. However, the memory cache is a relatively low 32K, which could create a slight bottleneck with large-memory applications in a multitasking environment.

The Premium's motherboard has plenty of built-in features, including one parallel and two serial ports, a floppy disk controller, and an IDE (Intelligent Drive Electronics) hard disk interface. That leaves plenty of room for expansion: You get one 8-bit and three 8/16-bit slots; unoccupied 32-bit slots double as 8/16-bit ones. Load the machine with 4MB RAM, a video board, and an ESDI controller, and four slots are left free.

Thanks to the IDE interface, you may not want to bother with an ESDI controller and drive. Like SCSI drives, IDE disk drives have all controller electronics built into them. AST contends that IDE drives are not only cheaper to implement than ESDI units but deliver the same performance—a claim our tests confirm. The only drawback to the IDE interface is a maximum drive size of 110MB.

The Premium 386/33's chassis is a stylish, AT-size box with two internal and three externally accessible half-height 5¼-inch drive bays. Like the other systems in this roundup, the Premium 386/33 includes an excellent ROM-based setup utility. Bundled software includes the EMS 4.0 expanded memory manager and disk-caching software.

With its board-level 486 upgrade, the Premium 386/33 offers an intriguing option for

those who want to get in on the ground floor of 486 performance. A tempting price, excellent CPU-speed RAM capacity, and overall classy design make this system a Best Buy.

Compaq Deskpro 386/33

Of the three systems, Compaq's Deskpro 386/33 delivers the most integrated features and the largest board capacity. Unfortunately, along with the unassailable Compaq reputation, the machine carries a monster $17,147 price tag in the *PC World* configuration, topping AST's entry by more than $4700.

The Deskpro 386/33 introduces an attractive new Compaq system unit. It's styled like the small-footprint Deskpros—with rounded corners, thumbscrew access, and a beige finish—but it's only a tad smaller than the old Compaq brown box. According to Compaq, the original Deskpro chassis has been officially retired.

Inside the new box, you'll find a large helping of integrated features: one parallel and two serial ports, a mouse port, and VGA circuitry. Like the Premium 386/33, the system has a built-in IDE interface, which in this case supports either an 84MB or a 110MB IDE drive; ESDI drives, which require a controller card, come in 320MB and 650MB capacities. If you opt for an IDE drive, you'll be left with a whopping six 8/16-bit slots free, with a floppy controller occupying the sole 8-bit slot. Even with an ESDI controller (in the standard *PC World* configuration), five free slots is a lot.

All 32-bit memory resides on a special board that holds up to 16MB and fits in the system's only 32-bit slot. Both the Premium 386/33 and the Zenith Z-386/33 offer at least twice the CPU-speed RAM capacity, but since 16MB is the maximum OS/2 can address directly, only users concerned about UNIX, tomorrow's 32-bit OS/2, or other very large memory applications are likely to care. Ironically, in large-memory applications, the Deskpro 386/33's 64K memory cache may support faster throughput than the smaller caches offered by the other two machines.

The Deskpro 386/33's drive capacity is excellent, thanks to Compaq's use of third-height devices. You can install one half-height and two third-height drives in an externally accessible bay, and two half-height hard disks (or a full-height one) in the internal bay, for a maximum of five devices.

With a proven track record in reliability and dealer support, Compaq has become the machine no one loses their job for buying. And with substantial discounts for volume buyers, the Deskpro 386/33's daunting retail price loses some of its sting. Nonetheless, with integration and superior expansion board capacity as its only compelling features, this system is not a hot bargain.

EXECUTIVE SUMMARY

Compaq Deskpro 386/33

33-MHz 80386-based computer

This unit has the best expansion board capacity in the roundup—plus Compaq's unparalleled reputation. Only the sky-high price keeps it from an excellent overall rating.

	POOR	FAIR	GOOD	EXCELLENT
CPU-speed RAM				●
Expandability				●
Ergonomic design				●
Performance				●
Overall value			●	

Reader service no. 641

Zenith Z-386/33

The Zenith Z-386/33 is a large-footprint system distinguished by an upgradable memory cache, plus a large drive and CPU-speed RAM capacity. But you may find the $15,497 price, in the *PC World* configuration, a bit steep.

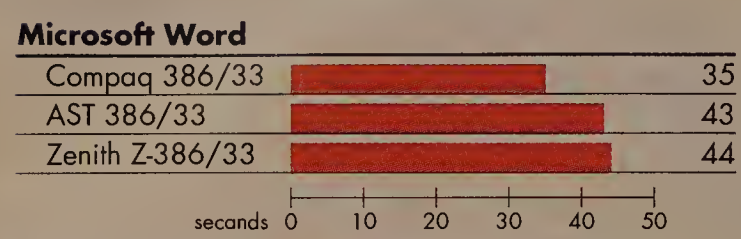
Like the Deskpro 386/33, the Z-386/33 keeps the CPU and sockets for an 80387 or Weitek 3167 math coprocessor on the motherboard. Unlike with any other system we've reviewed, however, all controller circuitry for the expansion bus, as well as the system BIOS and one parallel and two serial ports,

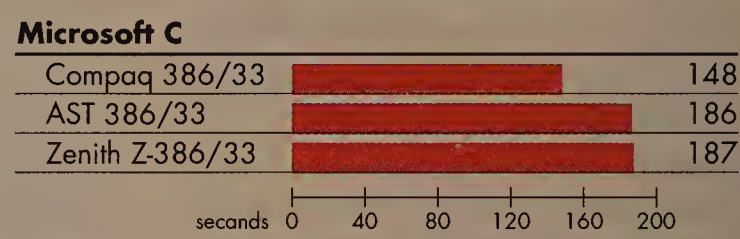
Compaq's Deskpro 386/33 delivers the most integrated features and the largest board capacity.

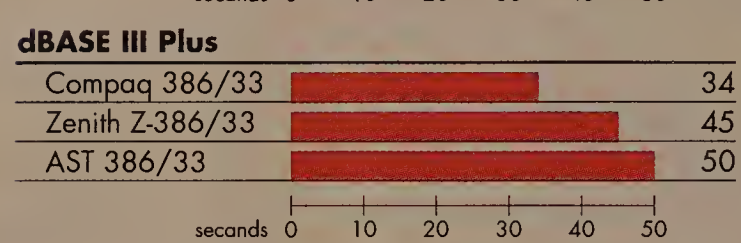
NSTL TEST REPORT

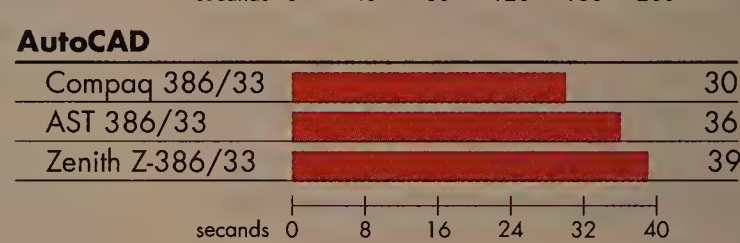
Compaq 386/33 Sets the Pace—But Will You Notice?

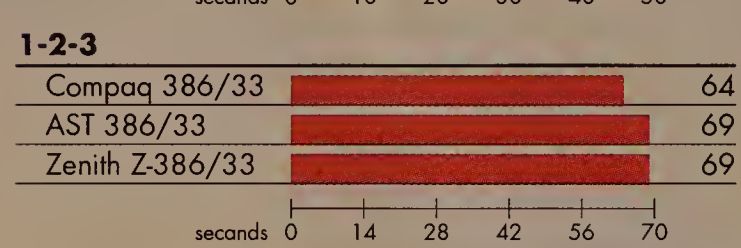
Clearly, Compaq's 33-MHz speedster turns in the fastest scores. But in most real-life business computing situations you'll probably find it tough to tell the difference between first- and third-place machines.











Methodology
All machines were tested with a coprocessor and the manufacturer's own 256K extended memory disk cache (except in the *1-2-3* benchmark). The AST 386/33 and the Compaq 386/33 were configured with a 320MB hard disk and 4MB of RAM. The Zenith Z-386/33 was configured with a 155MB hard disk and 2MB of RAM.

Microsoft Word 4.0
A *Microsoft Word* macro loads a 35-page, 140-paragraph document and performs search-and-replace and spell-checking operations. The first page of the document is then printed. Although the results of the benchmark depend primarily on processor and memory access speeds, display adapter and hard disk speeds are also contributing factors.

dBASE III Plus 1.1
The *dBASE III Plus* test measures the time required to prepare and print a report of past-due invoices. The report includes calculated fields and is based on three files: a 500-record customer file, a 1000-record invoice file, and a 2000-record item file. When disk caching is not used, the random access speed of the hard disk is, after processor speed, the most significant factor in this benchmark. With disk caching, sequential read performance becomes more important than random access.

1-2-3 2.01
In this benchmark, a *1-2-3* macro executes a series of recalculations using five different formulas within a 75-by-75-cell matrix. Because there are few screen updates and no disk access is required, the results depend almost entirely on processing and memory access speeds.

Microsoft C 5.0
The *Microsoft C* benchmark measures the time required to compile and link *XLISP*, a public-domain program composed of 25 C source code files. The most important factors in this benchmark are processor and memory access speeds. The performance of the hard disk is also a factor; generally, disk caching has little effect.

AutoCAD 9
In this benchmark, a three-dimensional sample drawing is retrieved and displayed using *AutoCAD*'s EGA driver. The zoom function is used to display the drawing from various perspectives; then the full drawing is printed. The results of the benchmark depend primarily on the speeds at which the processor and coprocessor operate and at which memory is accessed. The performance of the display adapter and the hard disk also have some effect.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

resides on an expansion board that permanently occupies one of the four 32-bit slots. Zenith says this arrangement made the motherboard easier to design.

The motherboard holds up to 8MB of RAM in 1MB SIMMs. Each of the three open 32-bit slots can hold a memory expansion board with an 8MB capacity, providing a 32MB maximum on CPU-speed RAM. Currently, the Z-386/33 includes a 16K memory cache. Although it has the smallest memory cache we've encountered, the Z-386/33 matched the Premium 386/33's score in the processing-intensive *1-2-3* test. For more demanding applications, Zenith plans to offer memory cache upgrades to 1MB by the end of this year.

Aw . . . What the Heck!

EXTREMELY POWERFUL

DesignCAD 3-D version 2.0 is as powerful as most CAD systems costing $5000 - $10,000! Features like: Complex Extrusions-linear, scaler, and circular, Blending of Surfaces, Shading, Cross Sectioning, Complex Sweeps and Translations, and Boolean operations make DesignCAD 3-D one of the most powerful 3-D CAD systems available . . . at any price! Engineers, Architects and Consultants constantly tell us that they use CAD systems costing thousands of dollars which are not as powerful as DesignCAD 3-D.

VERY EASY TO USE

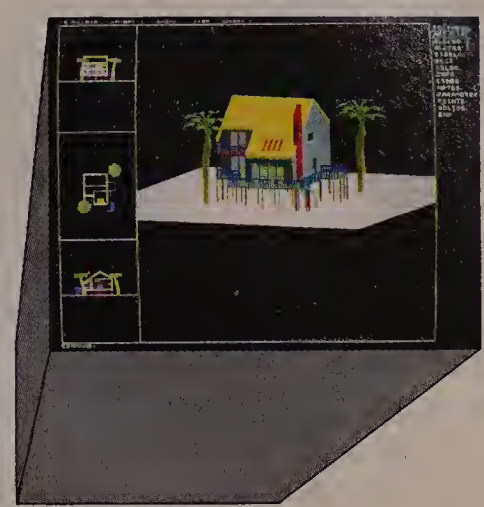
Just because DesignCAD 3-D is powerful doesn't mean it is difficult to use. Single keystroke commands and side-bar menus which give short directions on how to proceed make DesignCAD 3-D a snap to use! While not required, DesignCAD 3-D supports all popular digitizers and mice.

Many of the older, more cumbersome CAD systems require weeks of training before a user can be productive. DesignCAD 3-D users find they can be producing useful drawings in a matter of minutes! In a recent CAD contest only one contestant was able to match our drawing time. The package sold for $3000.00. The other CAD packages took up to twice as long to perform the same drawing and cost up to $5000.00!

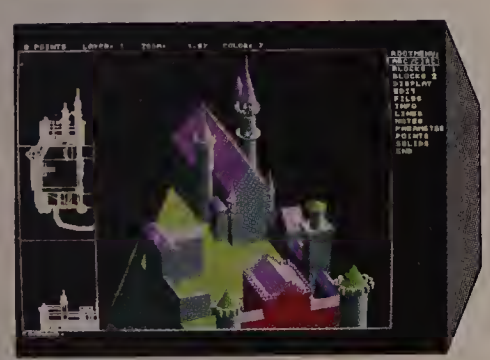
Still don't believe us? The goblet pictured below required only 16 keystrokes and 3 commands to create! The top, front, side, and isometric views were created simultaneously . . . in less than one minute!

VERY LOW PRICED

The first question asked by many people is, "Why is DesignCAD 3-D priced so low?" The answer? After developing DesignCAD 3-D version 2.0, we were unable to decide how the product should be priced. We consulted experts. We used the finest spreadsheets on the market. We took employee polls. Finally, in the great American Tradition, we said, *"Aw . . . What the Heck! Let's see the other guys beat this price!"* DesignCAD 3-D version 2.0 sells for $399.



DesignCAD 3-D only $399!



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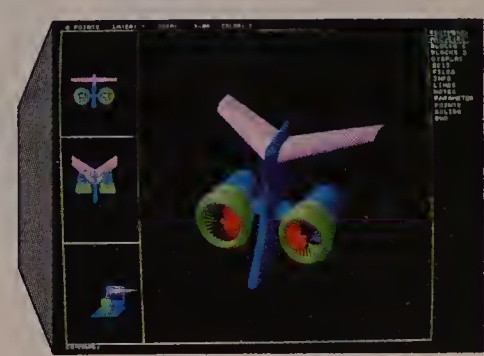

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DR. STEVENS, NASA Space Scientist/Engineer

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DesignCAD 3-D version 2.0 is available from most retail computer stores, or you may order directly from us. DesignCAD 3-D is available in a number of foreign languages from distributors throughout the world. All you need to run DesignCAD 3-D is an IBM PC Compatible and 640K RAM. DesignCAD 3-D supports most graphics cards, printers, plotters and digitizers. Free information and a demo diskette are available by contacting us at:

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Speed (MHz)	10/4.77	12.5/6.25	16/8	20/8
BIOS	Phoenix	Phoenix	Phoenix	Phoenix
Norton SI Rating v 4.0	2.1	12.3	17.6	22.0
Standard Memory	640K	512K	1MB	1MB
Shadow BIOS	—	Yes	Yes	384K
Memory Upgrades	—	640K/1/2/3/5MB	2/3/5/6/8MB	2/4/8/10/16MB
Coprocessor Support	8087	80287	80387SX	80287 or 80387
Expansion Slots: 32-bit	—	—	—	1
Expansion Slots: 16-bit	—	6	6	4
Expansion Slots: 8-bit	8	2	2	3
Dual HD/FD Controller	w/HD systems	Yes	Yes	Yes
Device Bays (Exposed/Internal)	2 Exp./2 Int.	3 Exp./2 Int.	3 Exp./1 Int.	3 Exp./2 Int.
Serial Ports	1	1	1	2
Additional I/O Ports	1 Par /1 Game	1 Parallel	1 Parallel	1 Parallel
Power Supply	150W	200W	200W	200W
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Base System, No Video — $1899				

386SX	VIDEO OPTIONS Include Monitor & Video Adapter			
Drive Options	Mono	14" Flat Mono	VGA Mono	VGA Color
w/32MB (40ms) & 1:1 Interleave	$1799	$1848	$1998	$2298
w/48MB (28ms) & 1:1 Interleave	$1899	$2048	$2198	$2498
w/80MB (28ms) & 1:1 Interleave	$2249	$2298	$2448	$2748
w/187MB (18ms) ESDI w/1:1 Interleave	$2894	$2943	$3093	$3393
Base System, No Video — $1399				

286/12	VIDEO OPTIONS Include Monitor & Video Adapter			
Drive Options	Mono	14" Flat Mono	EGA	VGA
w/32MB (40ms) & 1:1 Interleave	$1299	$1348	$1698	$1798
w/48MB (28ms) & 1:1 Interleave	$1399	$1448	$1798	$1898
w/80MB (28ms) & 1:1 Interleave	$1749	$1798	$2148	$2248
Base System, No Video — $899				

XT10	VIDEO OPTIONS Include Monitor & Video Adapter			
Drive Options	Mono†	CGA	EGA	VGA
Single Floppy	$699	$869	$1098	$1198
Dual Floppies	$779	$949	$1178	$1278
*w/32MB (40ms) Hard Drive	$979	$1149	$1378	$1478
Base System, No Video — $549				

* Includes Single 360K Floppy Drive
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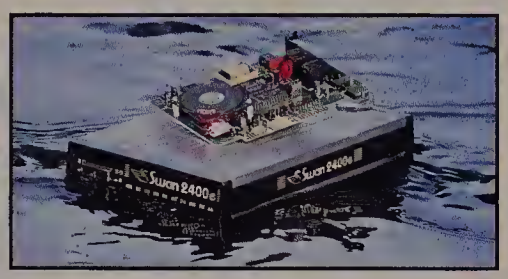

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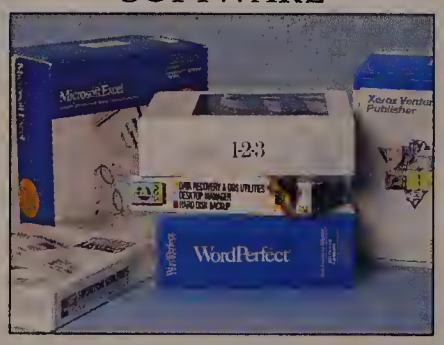

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S=PWJ

For a system that's somewhat larger than the original AT, the number of free slots is disappointing. With one of the four 32-bit slots permanently occupied, and a VGA board and ESDI controller taking up two of the three 8/16-bit slots, only one 8/16-bit and three 32-bit slots remain open. (As with the Premium 386/33, the 32-bit slots can take 8- and 16-bit boards.) The drive situation is better, with room for one internal and four externally accessible devices.

Zenith is generous in the software department, delivering OS/2 1.1 and *Windows/386* for free. That doesn't go very far in justifying a $15,000 price tag, however; as with the Deskpro 386/33, what you're really paying for is reputation. The standout features are the high ceiling on CPU-speed RAM and the expandable memory cache, which together

EXECUTIVE SUMMARY

Zenith Z-386/33

33-MHz 80386-based computer

This system comes with an expandable memory cache and support for 32MB of CPU-speed RAM, and you can count on the company being around for a while. The main drawbacks are a large footprint and a high price.

	POOR	FAIR	GOOD	EXCELLENT
CPU-speed RAM				●
Expandability				●
Ergonomic design			●	
Performance				●
Overall value			●	

Reader service no. 642

The Zenith Z-386/33's standout features are its high ceiling on CPU-speed RAM and its expandable memory cache.

AST's 486 UPGRADE SOLUTION

With plenty of fanfare, both IBM and AST have announced processor-board upgrades that turn certain of their 386 systems into 486s. Which of these upgrades is best—and what effect will the new boards have on your selection of a high-performance system?

When it arrives, the AST FASTboard 486/25 should stand head and shoulders above IBM's 486/25 Power Platform. Plug these 486-based upgrades into their respective machines, and the FASTboard's 64K external memory cache should yield memory access times considerably faster than those the Power Platform will deliver. And the FASTboard's support for the Weitek 4167 math coprocessor will mean unparalleled speed for some CAD applications.

This superior technology, however, hardly makes an upgraded Premium 386/33 or 386/25 the ultimate 25-MHz 486 machine. The 486 sets the stage for a new standard in performance. The Premium 386's expansion bus—a modified version of the industry-standard AT bus—offers bare-bones accommodations for such a high-class CPU. That leaves a Micro Channel–based 486 machine with at least two potential advantages (see the preview of ALR's 486 in this issue).

With a blazing CPU like the 486, you need mass storage devices that can keep pace, or you'll have a bottleneck. The only way a hard disk can consistently match 486 CPU performance is with a caching disk controller that has its own microprocessor and memory. Unlike the AT bus, both the 486 and the Micro Channel are designed to help multiple microprocessors share control of the bus—the Micro Channel theoretically can arbitrate up to 15 of them. In addition, the Micro Channel offers a special burst mode that's ideal for shoveling chunks of data, for example, from an intelligent disk controller's cache into system RAM.

There are still few intelligent Micro Channel devices, and it remains to be seen whether IBM's Power Platform will support the 486's multiprocessing capabilities. But in theory, both the Micro Channel and the forthcoming Extended Industry Standard Architecture (EISA)—which purportedly will offer even better burst mode and multiprocessing capabilities—should be a better home for a 486 than the Premium 386's bus.

The best way to think of the FASTboard upgrade is as icing on an already incredible deal—the Premium 386/33. If you think you'll need a blazingly fast server for, say, back-end, SQL-based batch processing, your work group may want to wait for—or move up to—an EISA or Micro Channel system that fully supports intelligent devices. (AST itself plans an EISA system.) But if you can't live without cutting-edge performance, and the idea of an "entry-level" 486 doesn't deter you, a FASTboard-compatible Premium 386 is today's high-performance system of choice. —*E. K.*

suit applications that need more megabytes than most users have on their hard disk.

Serving the Elite

If you count yourself in the select group that truly needs 33-MHz power *now*, the nearly identical performance of these three systems means shopping on the basis of price and expandability. Based on these criteria, the best deal among the three systems is clear: the AST Premium 386/33.

It's affordable and offers the largest memory capacity. In addition, its 486 upgrade goes IBM several times better by adding a 64K external memory cache to the 486's 8K internal cache, a move that should accelerate multitasking and multiuser-host operations. It also has a socket for the Weitek 4167 coprocessor, which can help CAD users attain workstation performance.

Of course, buying a pricey Compaq or Zenith unit guarantees you cutting-edge performance, and discounts may relieve the sticker shock. But when you're on the brink of a new generation of processors, why not save your money for a machine you can upgrade to a 486? Better yet, wait until the 486 systems arrive in force, and get an even better deal. ●

TJ Byers is a contributing editor and Eric Knorr a senior editor for PC World.

For more information about all products in this article, circle reader service no. 903.

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WHERE TO BUY

AST Premium 386/33
AST Research, Inc.
2121 Alton Ave.
Irvine, CA 92714
714/863-1333
LIST PRICE: Model 5 with 2MB RAM, 1.2MB floppy drive, 101-key keyboard, DOS 3.3, GW BASIC, EMS, disk caching $6595; Model 115V same as Model 5 except with 110MB AT-embedded hard disk, VGA Plus graphics adapter $8495; Model 325 same as Model 5 except with 320MB ESDI hard disk $10,245
ACCESSORIES: Memory Expansion board with 1MB RAM $949, 1MB SIMM $450; VGA Plus board $599; VGA color monitor $695; 1.44MB floppy drive $235; 40MB IDE hard disk $750, 90MB ESDI hard disk $1450, 110MB AT-embedded hard disk $1500, 150MB ESDI hard disk $1950, 320MB ESDI hard disk $3350; OS/2 1.1 $325
WARRANTY: one year carry-in
EXTENDED WARRANTY: on-site service, extended warranty available
TECHNICAL SUPPORT: no toll-free number, M–F 7:30–3:30
OTHER SUPPORT: BBS
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Compaq Deskpro 386/33
Compaq Computer Corp.
P.O. Box 692000
Houston, TX 77269
800/231-0900,
713/370-0670
LIST PRICE: Model 84 with 2MB RAM, 1.2MB floppy drive, 84MB IDE hard disk, Advanced Graphics board and Advanced Graphics monitor, 101-key keyboard $10,499; Model 320 same as Model 84 except with 320MB ESDI hard disk $14,999; Model 650 same as Model 84 except with 650MB ESDI hard disk $17,999
ACCESSORIES: 2MB RAM $1299; Advanced Graphics board $1499; VGA color monitor $699, Advanced Graphics monitor $1999; 1.44MB floppy drive $275; 110MB IDE hard disk $2799, 320MB ESDI hard disk $5899; 40MB tape backup $799, 150/250MB tape backup $1999; 80387 coprocessor $1599; DOS 4.01 $150, OS/2 version 1.1 $340
WARRANTY: one year carry-in
EXTENDED WARRANTY: dealer only
TECHNICAL SUPPORT: dealer only
OTHER SUPPORT: toll-free number to locate dealer
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Zenith Z-386/33
Zenith Data Systems
1000 Milwaukee Ave.
Glenview, IL 60025
800/553-0331
LIST PRICE: Model 150 with 2MB RAM, 1.44MB floppy drive, VGA board, 150MB ESDI hard disk, Zenith DOS 3.3 Plus, OS/2 1.1, Windows/386, 101-key keyboard $11,499; Model 320 same as Model 150 except with 320MB ESDI hard disk $13,499
ACCESSORIES: 8MB unpopulated memory expansion board $100; 1MB 80ns SIMM $699, 2MB SIMM $1299; VGA color monitor $699, Perfect VGA color monitor (ZCM-1490) $999
WARRANTY: one year carry-in or three months on-site
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: no toll-free number, M–F 8–4:30
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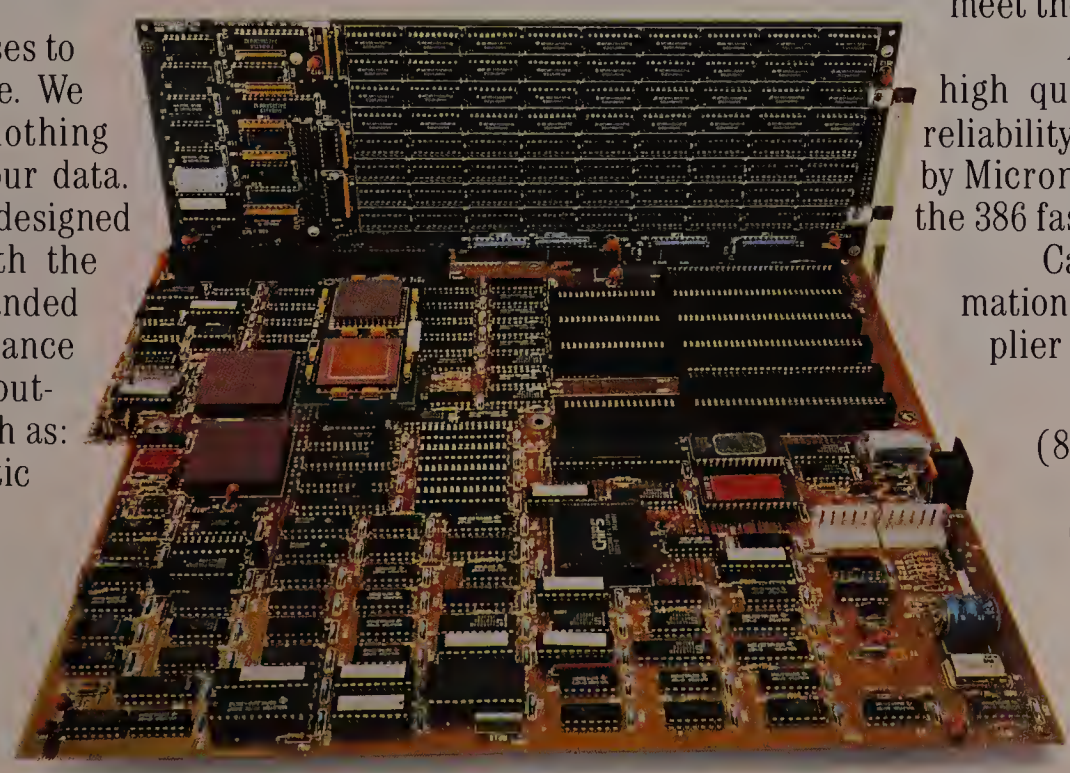

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On Board Memory	1MB	1MB	1MB	640K	1MB	2MB	1MB	1MB
Possible On Board Upgrade	4MB	NONE	13MB	4.6MB	8MB	4MB	16MB	16MB
Floppy	1.2MB (5¼)	1.44MB (3½)	1.44MB (3½)	1.2MB (5¼)	1.2MB (5¼)	1.44MB (3½)	1.44MB (3½)	1.2MB (5¼)
Standard Hard Disk	40MB (28ms)	20MB (80ms)	20MB (29ms)	20MB (40ms)	40MB (28ms)	115MB (28ms)	40MB (29ms)	40MB (29ms)
Available Hard Disk Upgrades[1]	86MB ($395)	NONE	40MB ($1399)	40MB ($300)	300MB ($1995)	314MB ($6495)	300MB ($6499)	322MB ($4899)
Operating System Software	DOS 4.01 ($45)	DOS 4.01 ($120)	DOS 4.01 ($120)	DOS 4.01 ($119)	DOS 4.01 ($45)	DOS 4.01 ($120)	DOS 4.01 ($120)	DOS 4.01 ($119)
Price	$1595	$3595[2]	$3199[2]	$1699	$1995	$8995	$6599	$3699
Optional EGA Card/ Monitor	$395	—	—	—	$395	—	—	—
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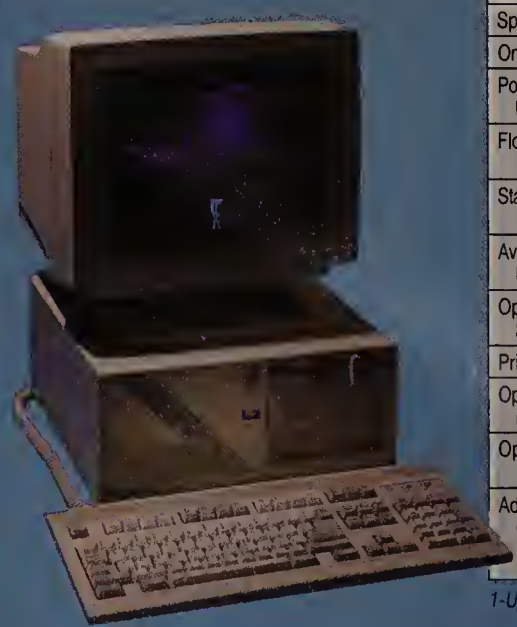

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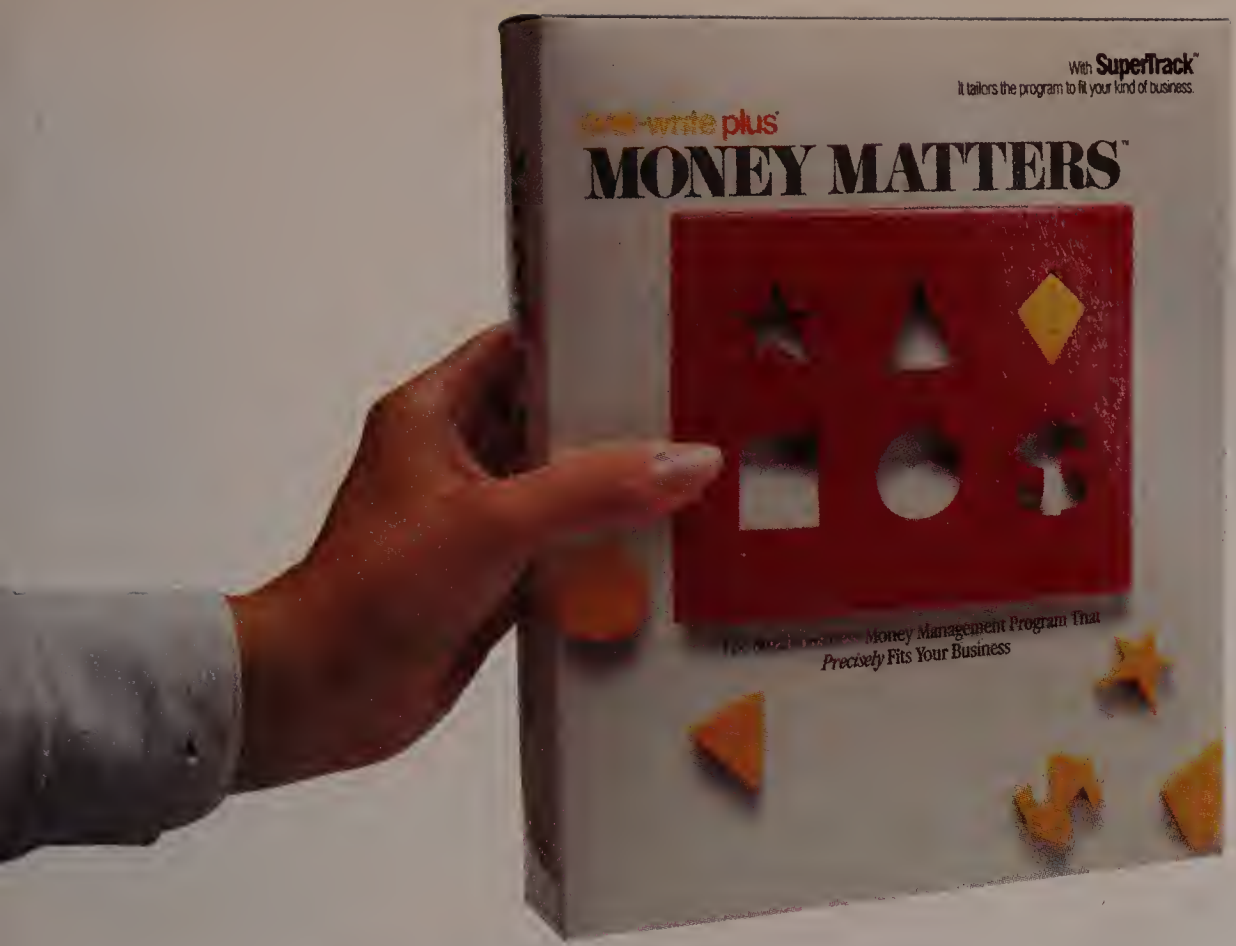

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Power Spreadsheets: A New Standard?

The latest generation of 3-D spreadsheets—Excel, 1-2-3 release 3, and SuperCalc5—move light-years past the old Lotus standard.

If you know what you need, the right choice is obvious.

Richard Scoville

After years of waiting for *1-2-3* release 3, perhaps you thought you could have it all. Maybe you imagined that the new release would combine powerful application-development features, sophisticated reporting capabilities, a superb interface, and speed in one neatly wrapped, easily upgradable package. But the fact is, not a spreadsheet on the market can do everything you wish it would, and release 3 is no exception.

Although *1-2-3* release 3 offers a stunning array of powerful features, it leaves novices struggling with a dated, difficult interface. Release 3's archrival *Excel* has upped the spreadsheet stakes with powerful reporting capabilities and a graphic interface that's both potent and intuitive. And *SuperCalc* has stayed in the game by improving on the *1-2-3* release 2 platform with a host of extra features.

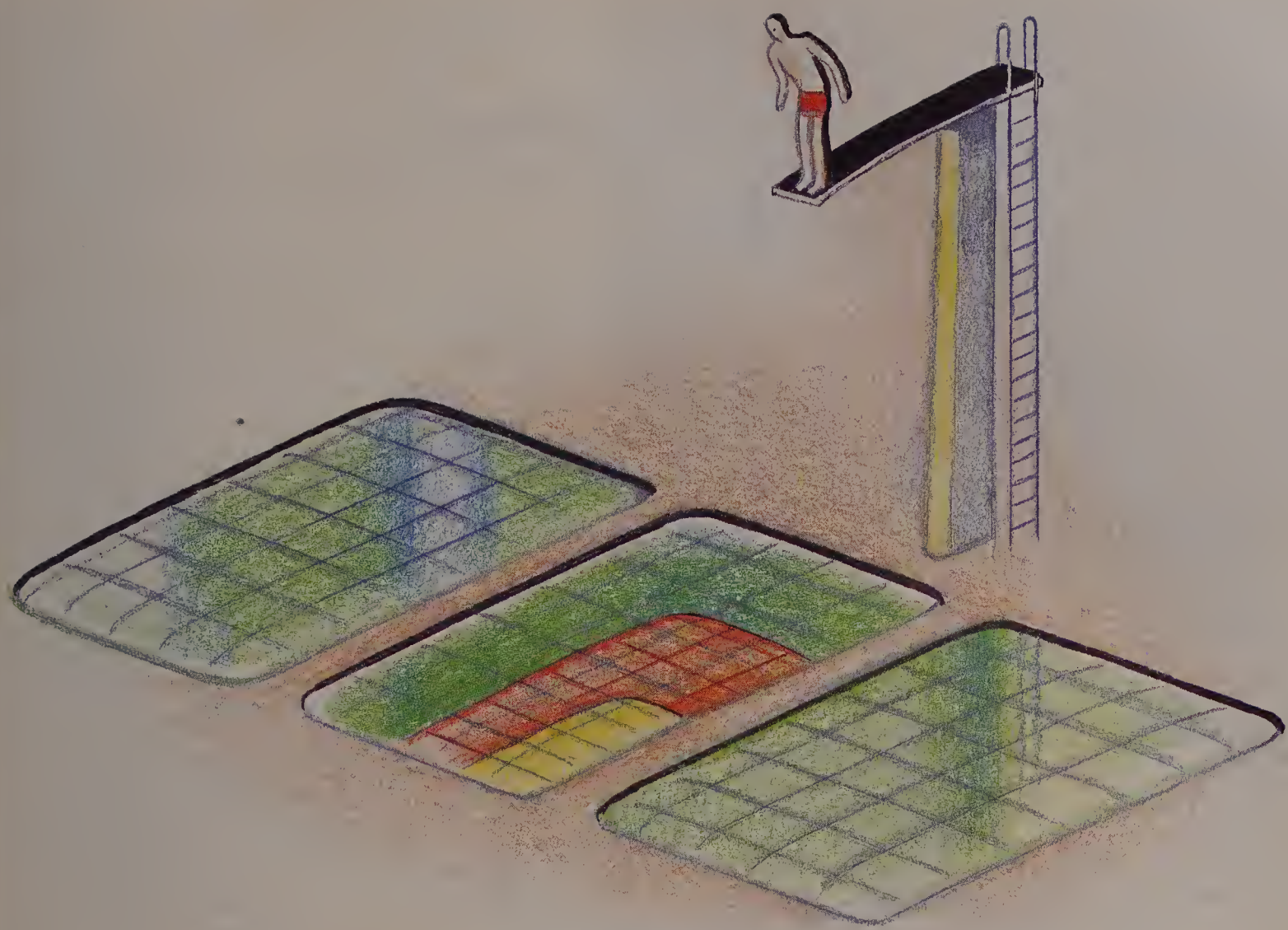
But even if you can't have it all, at least the choice is finally clear. *1-2-3* is best for users who need to squeeze every last bit of application development power out of their worksheets. *Excel* wins for a larger cross section of users, those who prefer its more intuitive interface and powerful reporting. *SuperCalc* doesn't pose a significant threat to either because it lacks the power of *1-2-3* and the graphic interface of *Excel*.

Brave New World of Hardware

For most users, standardizing on any of these products means facing up to the cost of new hardware. Both *1-2-3* release 3 and *Excel* require at least a 286 with a hard disk, and *1-2-3* needs at least 1MB of memory. For *Excel*, you'll also want EGA or VGA graphics and a mouse. Even *SuperCalc*, which runs on an ordinary PC, is in our opinion too sluggish on XTs to be practical.

All three programs require costly extra memory to handle large worksheets, and all support up to 32MB of expanded memory under EMS 4.0. But *1-2-3* release 3, running in protected mode with a 286 or 386 processor, can also use up to 16MB of extended memory (for a total of 48MB), breaking DOS's 640K conventional memory barrier. And because release 3 loads itself into extended memory first, it frees up conventional memory for network drivers and TSRs.

Although *1-2-3*'s extended memory requirement costs money, it pays off in performance: In benchmarks conducted by National



DAVID SUTER

Software Testing Laboratories (NSTL), release 3 was faster than *SuperCalc5* and *Excel 2.1*. *SuperCalc* was the slowest by far in every test.

What You Get for Your Money

All the products offer the features and functionality of *1-2-3 2.01*, and all enhance this now-standard spreadsheet platform. But the products' respective strengths lie in clearly demarcated areas.

All the programs offer competent worksheet design and development features, but only *1-2-3* offers a true 3-D work space. *SuperCalc*'s multiple worksheet "pages" allow more than one worksheet per file, but its implementation falls short of *1-2-3*'s. And while all three programs permit interfile macro execution and formula links, *1-2-3* release 3 does more: It promises to alter the way we think about spreadsheets.

In terms of data base capabilities, release 3 is clearly superior—new data maintenance features, relational capabilities, external data base access, and calculated output fields open the way to highly sophisticated applications. By comparison, *SuperCalc5*'s data base is a make-over of *1-2-3 2.01*'s; and while *Excel*'s automatic data entry forms are handy, *Excel* can't match the sheer data base horsepower of the new *1-2-3*.

When it comes to good-looking reports, *Excel* lives up to its name with WYSIWYG preview, flexible graphics, easy and accurate font selection, and hassle-free printing. *SuperCalc*, too, features superb reporting and graphics. In comparison, *1-2-3* release 3 just doesn't measure up; it lacks print preview and precise control over fonts.

In the look-and-feel department, *Excel* takes the competition hands down. Its *Windows* interface is smooth, intuitive, and accessible to novices. *1-2-3* release 3, on the other hand, is still *1-2-3:* Advanced users will find it pleasantly faster; beginners will struggle just as they do with *2.01*. And although *SuperCalc*'s interface and menu system follow *1-2-3*'s tree approach, its many additional branches and options make it slow.

Upgrades, new hardware, more training for the troops—all this means hassles and

FEATURES EVALUATION

Excel Defines the Power Spreadsheet

1-2-3 release 3 offers extraordinary 3-D and data base features, but it doesn't match the first-class graphics and reporting of SuperCalc5 and Excel 2.1.

● Yes
○ No
◒ Deficient
△ Limited only by available RAM

Spreadsheet	1-2-3 release 2.01	1-2-3 release 3	Excel 2.1	SuperCalc5
Worksheets per file	1	256	1	255
Windows per screen	2	3	△	6
Supports dynamically linked files	○	●	●	●
3-D capability	○	●	○	◒[1]
Saves work space	○	○	●	○
Array processing	○	○	●	○
Selects multiple ranges	○	○	●	○
Pastes range names in formulas	○	●	●	◒[2]
Undo command	○	●	●	●
Traces formula references	◒[3]	◒[3]	●	●
Cell noting	○	●	●	○
Real-time data import	○	○	●	○
Supports mouse	○	○	●	○
Formats values in any color	○	◒[4]	●	○
Solves simultaneous equations	○	○	●	●
Command-level password protection	●	●	●	○
Data base				
Concurrent sort keys	2	255	3	3
Column sort	○	○	●	●
Joins two data base tables	○	●	◒[5]	○
Supports calculated output fields	○	●	○	○
Provides data input form	○	○	●	○
Queries external data bases	○	●	●[5]	○
Reads/writes .DBF files	○	●	●	●

Reporting and graphs	1-2-3 release 2.01	1-2-3 release 3	Excel 2.1	SuperCalc5
WYSIWYG preview	●[6]	○	●	◒[7]
Multiline headers and footers	○	○	○	●
Named reports	○	●	○	○
Font styles per worksheet	1	8	4	8
Prints in color	○	●	●	◒[7]
Background printing	○	●	●	○
Prints text and graphs together	○	●	○	○
Prints multiple ranges per page	◒[8]	●	○	◒[8]
Macros				
Allows separate macro worksheets	○	●	●	●
Macro keystroke recorder	○	●	●	●
User-defined functions	○	◒[9]	●	○
Step mode/trace cells option	●	●	●	●
DOS access from macro procedure	○	●	○	○
Reads/writes 1-2-3 macros	●	●	●[10]	●

[1] Does not support all operations, such as formatting, across multiple worksheet pages.
[2] Current worksheet page only.
[3] Circular references only.
[4] Negatives in red only.
[5] With Q+E. Relational capability is available with external data bases only.
[6] With included add-in, Allways.
[7] For graphics but not for reports.
[8] Not on laser printers.
[9] With Lotus's add-in tool kit.
[10] With translation utility.

big bucks. Before you make the investment, make sure switching or upgrading will buy extra productivity. Remember, *1-2-3 2.2* with *Allways* will offer a lot of spreadsheet, run on an XT, and cost less than $400.

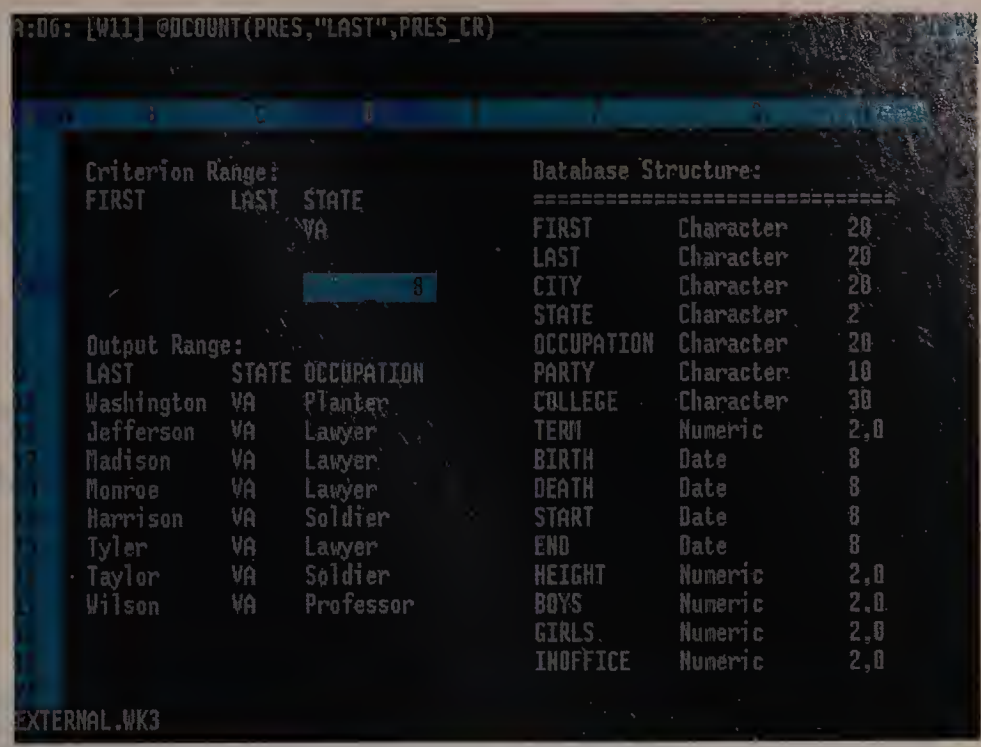
1-2-3 Release 3

1-2-3 release 3, which runs under either DOS or OS/2, provides unprecedented data base potential, a seamless 3-D interface, and some carefully chosen improvements for editing, graphing, and printing. For power-hungry applications, it's a dream come true.

Release 3 particularly surpasses the other products in its 3-D capability. In *1-2-3* release 2.01, *Excel*, and *SuperCalc*, ranges can be thought of as rectangles; in release 3, ranges are solids. The implications are staggering: A single file can contain up to 256 worksheet layers, making it easier to design accurate, compact worksheets. In marked contrast with *SuperCalc*, *1-2-3*'s range names and pointing techniques extend smoothly into the third dimension, and most commands, including data tables, can accept a 3-D range. (For practical tips on these new features, see "Exploring 1-2-3's Third Dimension" in the "How To" section of this issue.)

1-2-3's data base is another area where new features are both powerful and superbly implemented. The relational capability, for example, allows you to extract related information from more than one input range, either within the current worksheet or on disk. Release 3 also includes a driver that lets you query, insert records, and calculate data base functions directly from external *dBASE III* files. Additional enhancements include calculated output fields, which shrink worksheets by eliminating duplicate formulas; automatic updating of input range records; better linking of data bases and range names; plus new @ functions and a new {FORM} macro command for developing sophisticated data entry forms.

Although Lotus has improved release 2.01's notoriously weak graphs, the result is neither as versatile as *SuperCalc* nor as nifty as *Excel*. Nevertheless, with release 3 you can choose from a better selection of graph styles, view a graph in a spreadsheet window, and print graphs without running a separate utility. The ability to print multiple ranges on a single page makes complex reports possible on laser as well as dot matrix printers. And once you've set up a report, you can name it as you would a graph, thus making it easy to generate multiple reports from the same worksheet. Other new features include PostScript support and a print spooler with queue control.



1-2-3 release 3 permits relational queries of external data bases from within a worksheet. You can view the structure of the external table, as shown, extract records, or create data base statistical functions.

But font control is primitive: Fonts are associated with entire report sections, not ranges. Worse yet, you don't get a "live" menu of the specific fonts available with your printer, as you do with *Excel*. And there's no WYSIWYG print preview. Ironically, release 2.01 with *Allways* provides better printer control than release 3.

As expected, there are several new macro features, including a keystroke recorder, which unlike *SuperCalc*'s system is easy to use. Release 3's multifile capability means that as with *Excel* and *SuperCalc*, you can store utility macros in a separate library file and use them with any worksheet.

When it comes to performance, *1-2-3* is faster than the other spreadsheets in expanded memory—but unlike the other programs, it requires a system with at least 1MB of RAM. In tests performed with 2MB of expanded memory, release 3 did far better than *SuperCalc* and somewhat better than *Excel*. Additionally, NSTL benchmarks show that release 3 works faster in extended memory than expanded. And the more extended memory you have, the faster it works. That's because if you have at least 1MB of extended memory, release 3 loads all its program code into memory instead of using slower overlays

EXECUTIVE SUMMARY

1-2-3 release 3

Spreadsheet

The new *1-2-3* provides a superb 3-D workspace and relational data base capability, plus dozens of editing, graphics, and reparting improvements. It's a fine choice for users who need pawerful application development capabilities. But its audience is the thin crust at the tap: *Excel*'s approachable interface and spiffy reports have broader appeal.

	POOR	FAIR	GOOD	EXCELLENT
Spreadsheet				●
Data base				●
Reporting and graphs			●	
Macros			●	
Performance				●
Overall value				●

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that must be accessed from the hard disk.

When all is said and done, *1-2-3* release 3 was worth the wait for power users. Its high-end enhancements are executed brilliantly; in fact, those who require powerful application development tools are sure to love it. But in our opinion, this audience is a marginal one. For the vast majority of users, *Excel* is a better choice.

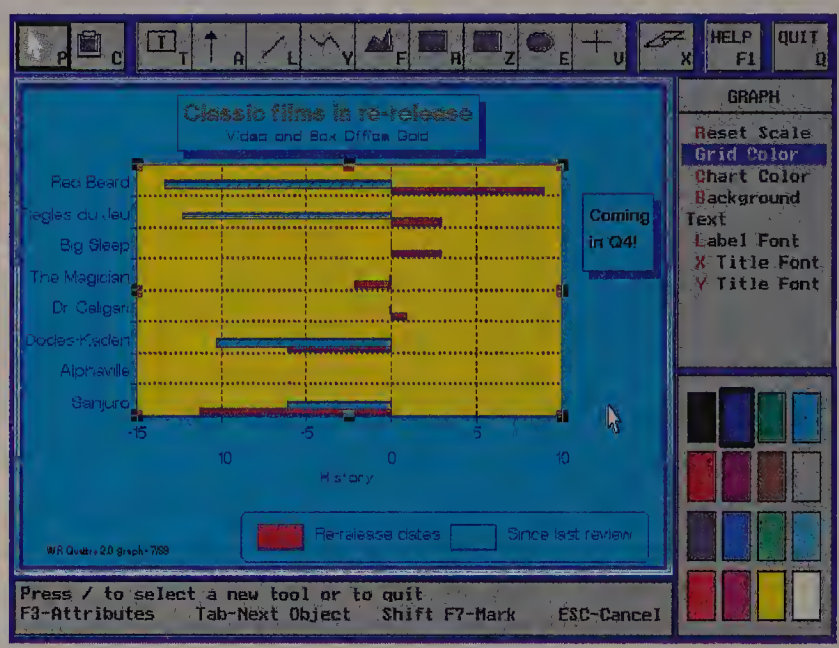
That's primarily because *1-2-3*'s character-based interface simply hasn't kept pace with the times. Though it's fast for experienced users, *1-2-3*'s menu system makes novices feel like they're lost in a labyrinth. Re-

TWO PERFECTLY PROFESSIONAL SPREADSHEETS

Quattro Professional 2.0 and PlanPerfect 5.0

William Rodarmor

While the high-end spreadsheets do battle on Centre Court and 1-2-3 release 2.2 joins the game, upgrades to *Quattro* and *PlanPerfect* wait their turn. To judge by the betas, fans will discover some stylish new strokes.



Thanks to Quattro Professional 2.0's powerful graph-customizing resources, users may decide they don't really need a separate charting package.

Quattro Professional 2.0: Visual Pizzazz

A big jump in price and features will mark Borland's *Quattro Professional 2.0* when it ships later this fall. The $495 spreadsheet will offer hot links between worksheets, built-in graph annotation, and a WYSIWYG preview mode. Moreover, you'll be able to embed multiple graphs in a worksheet and watch them redraw as you change the data. Borland says *Quattro 1.0*'s minimal recalculation has been greatly speeded up, and that a new restartable background recalc quickly returns keyboard control to the user. Borland will continue to sell *Quattro 1.0;* version 2.0 is aimed at graphics-conscious users who want worksheet linking in a DOS-based product.

Though *Quattro 2.0*'s elaborate menus take some time to navigate, they offer a host of new options, particularly in data entry and editing. While still limited to one worksheet per file, *Quattro 2.0* can load multiple files in memory and will outdo *1-2-3* release 3 by displaying up to 32 tiled, stacked, or overlapping worksheet file windows. The program supports dynamic links to cells or ranges in other worksheets and maintains correct cell references even if you change the structure of the dependent sheets.

Building on its predecessor's reputation for ease of use, *Quattro 2.0* will match some of *Excel*'s most convenient features: You'll be able to group related files and speed-load them together, use a mouse, and preview your formatted worksheet for last-minute proofreading. Other niceties include data compression, sideways printing, and a substantial list of new @ functions. Users will also appreciate the abilities to add hidden comments to a cell and to search and replace cell and named-block references.

Most of *Quattro 2.0*'s talents will show up both on screen and on paper. You can use up to eight Bitstream fonts on a worksheet and embellish cell ranges with line drawing and shading. Finally, *Quattro 2.0*'s graph annotation feature nearly matches that of a full-fledged charting package.

Quattro Professional 2.0 is the four-door version of Borland's sporty original. The spreadsheet has gained some weight in its bid to best *1-2-3* release 3 and *Excel*, but it hasn't abandoned the touches that give *Quattro 1.0* its nimble feel.

PlanPerfect 5.0: In the Family Way

While *Quattro Professional 2.0* is a big leap forward, *PlanPerfect 5.0* is an evolutionary move deeper into the WordPerfect family of products. In its last incarnation, *PlanPerfect* got mixed reviews: praise for its multiple worksheets, file linking, and excellent text

lease 3's many additional options make the problem even worse. Surprisingly, Lotus has neglected to provide either a prompt like *SuperCalc*'s that traces your current menu position or the settings sheets that release 2.2 is expected to include.

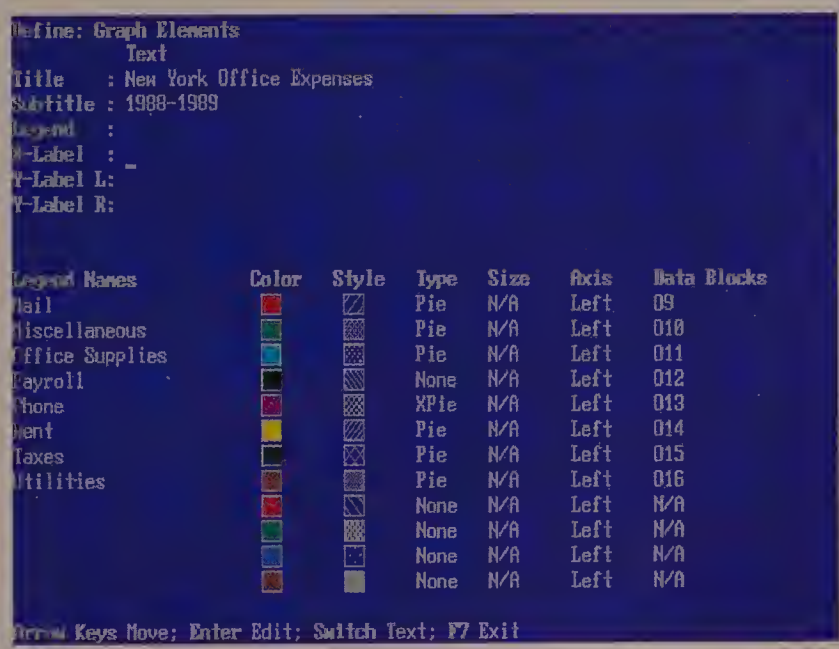
Some small touches make manipulating *1-2-3* worksheets easier: an undo feature; search and replace; and the ability to paste range names and functions into formulas, to view formulas that exceed the width of the screen, and to change the width of several columns at once. Lotus also deserves credit for vastly improving the help system. But ba-

handling; grumbles about the function-key interface and slow speed. Now updated to version 5.0, *PlanPerfect* gains *1-2-3*–style and pulldown menus; increased file compatibility; and more versatile printing, graphing, and charting. It also uses optimal minimal (but not background) recalc to address version 3.0's sluggishness. WordPerfect says the program can retrieve a *3.0* file faster than the older spreadsheet, even though it's being converted to *5.0* format in the process.

The major thrust behind the upgrade seems to be further convergence with *WordPerfect*, however. The two share more commands, and the spreadsheet now uses the same printer drivers and macro routines as the word processor. Moreover, their print menu and print preview features are quite similar. And *PlanPerfect 5.0* incorporates a programmable file macro language that is almost identical to *WordPerfect 5.0*'s.

File compatibility, a problem with *PlanPerfect 3.0*, should be somewhat improved. Version 5.0 will import and export *WordPerfect 4.2* and *5.0* files as well as *PlanPerfect/MathPlan*, *1-2-3*, *dBASE II* and *III*, ASCII, and delimited file formats. WordPerfect claims *PlanPerfect 5.0* automatically converts many *1-2-3* macros but admits that most *1-2-3* printing and graphics macros will require some manual conversion.

PlanPerfect 5.0 lacks line and box drawing but lets you assign multiple attributes and use up to 32 fonts in one worksheet. For added visual impact, you can display and print two graphs on the same page.



PlanPerfect 5.0 offers a lot of control over graphics, but customizing the text in a graph requires a visit to a dauntingly complex screen.

PlanPerfect 5.0's increased file compatibility, graphics talent, and speed are attractive options, and the addition of two new menu styles may broaden the program's appeal. But the upgrade will be popular mainly with people already at home on the WordPerfect range.

William Rodarmor is an assistant editor for PC World.

WHERE TO BUY

PlanPerfect 5.0
WordPerfect Corp.
1555 N. Technalagy Way
Orem, UT 84057
800/321-4566, 800/321-3248 (tech support), 801/225-4414 (BBS)
LIST PRICE: $495, upgrade $75
REQUIREMENTS: 512K, DOS 2.0 ar later version (hard disk recammended)
TECHNICAL SUPPORT: unlimited, tall-free number M–F 7–6
OTHER SUPPORT: user BBS, quarterly newsletter free to registered users, CompuServe farum (GO WPSG)
Reader service no. 735

Quattro Professional 2.0
Borland Int'l.
1800 Green Hills Rd.
P.O. Box 660001
Scatts Valley, CA 95066-0001
408/438-8400, 408/438-8696 (fax)
LIST PRICE: $495; upgrade $79, $99 far unregistered users
REQUIREMENTS: 512K, hard disk, DOS 2.0 ar later versian
TECHNICAL SUPPORT: unlimited, toll number, M–F 8–5
OTHER SUPPORT: MCI message service, BIX Farum (JOIN BORLAND), CompuServe Farum (GO BORLAND)
Reader service no. 736

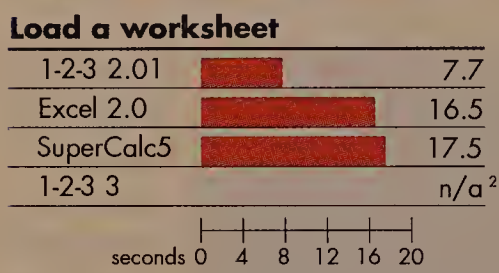
NSTL TEST REPORT

1-2-3 Release 3: Faster Than Ever

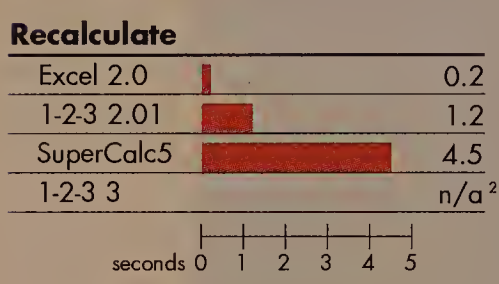
1-2-3 release 3 won't run at all in a 640K system, but it surpassed Excel 2.0 and SuperCalc5 in every speed test using 2MB of expanded or extended memory. Furthermore, most release 3 functions are noticeably faster than release 2.01's.

Conventional Memory

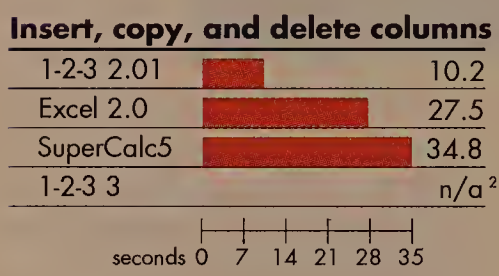
Load a worksheet



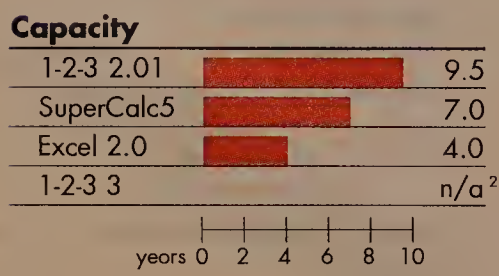
Recalculate



Insert, copy, and delete columns

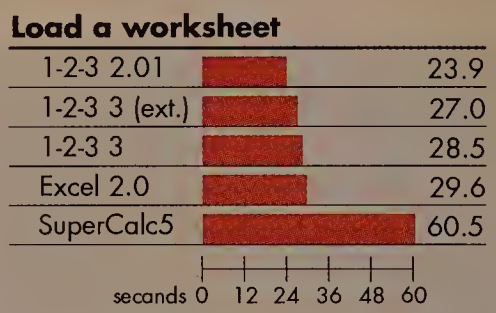


Capacity

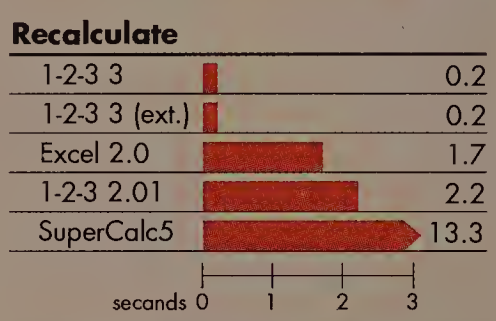


Expanded/Extended Memory [1]

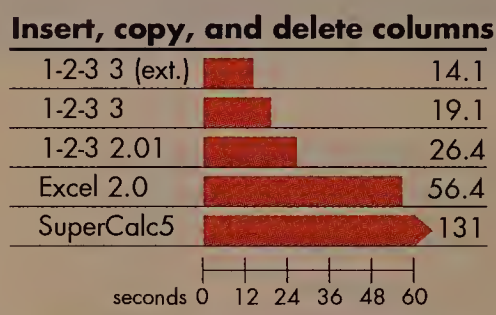
Load a worksheet



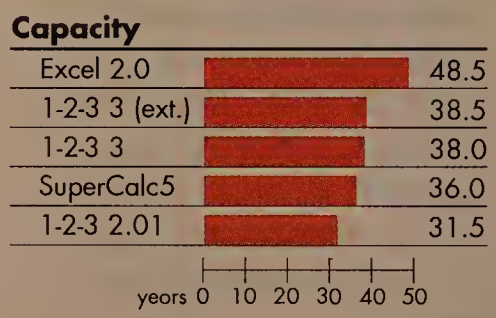
Recalculate



Insert, copy, and delete columns



Capacity



[1] Figures are for expanded memory except where "(ext.)" indicates extended memory.
[2] 1-2-3 3 will not run with conventional memory alone.

Methodology
A 12-MHz Compaq Deskpro 286 with 640K of RAM and a 40MB hard disk was used for conventional memory benchmarks. For expanded and extended memory tests, a 2MB Intel AboveBoard Plus and a math coprocessor were added. Conventional memory tests used a worksheet containing a three-year business plan. Expanded and extended memory tests used a worksheet containing an eight-year business plan. *1-2-3 2.01* was tested with the bundled *Speedup* add-in.

Load a worksheet
This test measured how long it took to load the test worksheet.

Recalculate
This test measured how long it took the spreadsheet to recalculate after a new value was entered into cell B18 (Sales).

Insert, copy, and delete columns
This test measured the time required to insert blank columns (P1..AD195), copy other columns into the new columns (AE1..AR195 to P1..AD195), and then delete the copied columns. Each step was timed separately, then the times were added.

Capacity
This test measured worksheet capacity by counting how many additional years' worth of data could be added to the worksheet. If an entire year could not be added, an attempt was made to add six months.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

sic construction tasks are still tedious compared with *Excel*'s point-and-click approach. All in all, *Excel*'s approachable interface and superb reporting capabilities make it a much stronger candidate for the vast majority of users.

Excel 2.1

There's no 3-D, the data base is just OK, and for complex applications, it's slow. But *Excel* has a superb *Windows* interface with mouse control, terrific graphs, extensive functions

and macros, and sophisticated verification tools. And Microsoft is offering a low-cost data base add-in that gives access to external *dBASE* files with full relational capability. These features make *Excel* our Best Buy and the ideal tool for users who crave sophisticated reporting and desire the advantages of a graphic interface.

The *Windows* interface is a unique combination of simplicity and flexibility. Instead of requiring you to use a series of menus for every action, *Excel*'s graphics approach allows for hands-on manipulation of the worksheet. As a result, *Excel* can offer lots of options without the confusing menu proliferation that plagues *SuperCalc* and *1-2-3*. Its major drawback is that the interface can impede skilled users, who may find *1-2-3*'s menus faster.

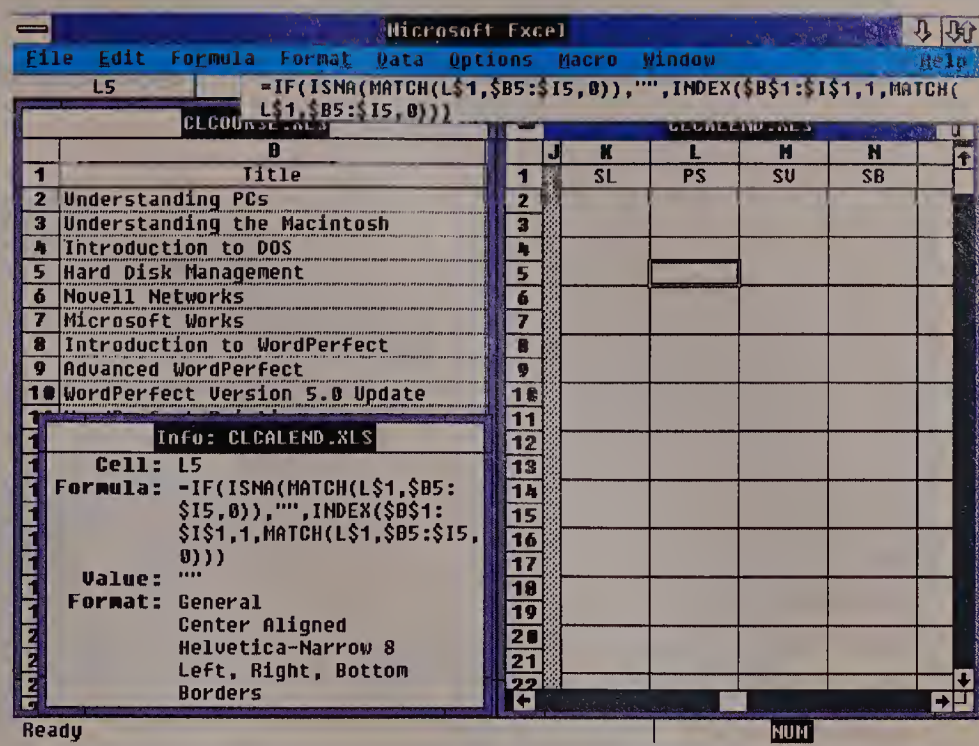
Excel's charts are legendary, and with good reason; just select a range, open a new chart, and voilà—presentation graphics. But mastering *Excel*'s charts is harder than it looks; some operations that ought to be simple, like adding a new data range to an existing chart, are frustrating for new users. Overall, though, *Excel*'s graphing capability, WYSIWYG preview, and visible page margins make it a superb tool for reporting.

By itself, *Excel*'s data base is unremarkable. However, coincident with the debut of release 3, Microsoft announced an agreement with Pioneer Software Systems to market *Q+E*, a SQL-based external data base query facility that provides relational access to disk-resident .DBF files. The cost is $10 for new *Excel* users or $49.95 for current registered users. *Q+E* gives *Excel* and *1-2-3* similar external query capabilities; at this writing, the *Excel* system also allows you to update external files, and it enjoys the formidable advantage of the graphic interface.

Automatic data entry forms, customizable via a macro dialog box, are the most notable feature of *Excel*'s data base system. Otherwise, *Excel* provides roughly the same functions as release 2.01, with the annoying exception that you must select the output range each time you extract records.

Unlike release 3, *Excel* lacks true 3-D. You can open multiple files, view them on screen in separate windows, and create formulas that reference cells and ranges in other open files; but a range is strictly a two-dimensional structure within a single worksheet.

Excel's procedural macros are a bit bewildering to the new Lotus convert because they are based on complete commands, not individual keystrokes. But their flexibility and ease of use are remarkable. When you



Excel's Info Window offers a useful way to diagnose spreadsheet problems. By leaving the window exposed, you can see a list of the formulas that depend on a selected cell and easily trace a chain of calculations through the spreadsheet.

EXECUTIVE SUMMARY

Excel

Spreadsheet

BEST BUY

Excel offers an accessible *Windows* interface, great-looking reports and graphs, an easy-to-understand macro language, and external data base access through *Q+E*. It's the logical choice for users who don't need release 3's 3-D workspace and relational data base, and it earns a Best Buy for its superb interface and reporting capabilities.

	POOR	FAIR	GOOD	EXCELLENT
Spreadsheet				●
Data base			●	
Reporting and graphs				●
Macros				●
Performance			●	
Overall value				●

Reader service no. 602

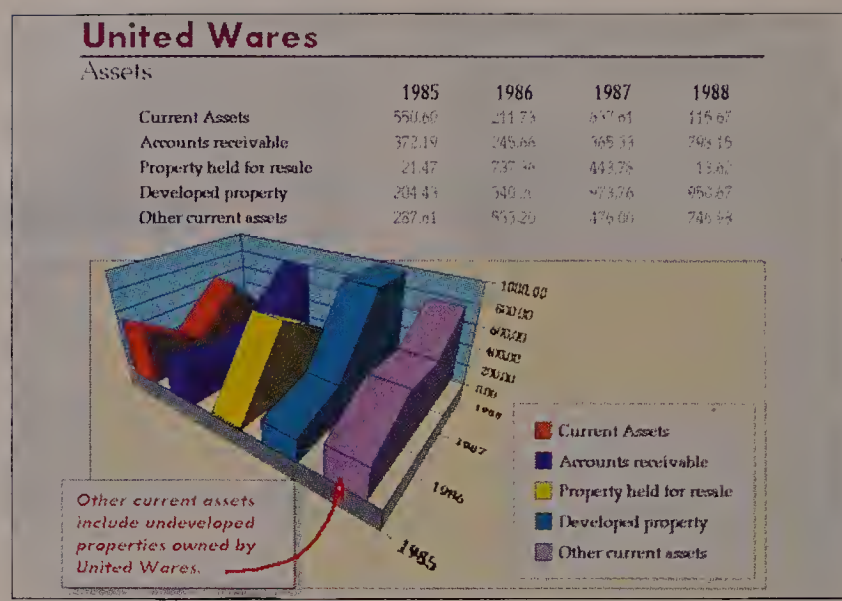
FORGET DOS! OS/2 SPREADSHEETS ARE COMING

Anita Amirrezvani

Even as we debate the merits of DOS-based spreadsheets, the industry is propelling itself in a new direction: OS/2. Despite Presentation Manager's demanding hardware requirements—3MB to 4MB of memory, a hard disk, video graphics, and for all practical purposes, a 386 processor—the new environment's graphic interface, massive memory support, and multitasking offer irresistible incentives to DOS spreadsheet users.

Several upcoming products from major vendors promise all the advantages of OS/2—and more. *1-2-3/G*, Lotus's Presentation Manager spreadsheet, is an open secret, and Ashton-Tate's *Full Impact*, currently available for the Macintosh, is also rumored to be under development for Presentation Manager.

But these products won't be the first out of the gate—not if Microsoft and Informix have their way. This fall, Microsoft plans to ship *Microsoft Excel for OS/2*, a slightly enhanced version of *Excel for Windows*. And with *Wingz for OS/2*, Informix intends to mount the first serious challenge to *Excel*—and even hopes to surpass it in several key areas.



Wingz for OS/2 is expected to offer unusually fine presentation capabilities. Shown here is a true 3-D graph whose values are dynamically linked to the numbers in the worksheet.

Microsoft Excel for OS/2

Don't be surprised if *Excel for OS/2* looks and feels much like *Excel for Windows*. Like other first-generation OS/2 products, it's basically the same software running in a new environment.

A few enhancements promise better functionality. *Excel*'s new Data Consolidate command, for example, prompts you to select files for consolidation and then automatically creates a new, consolidated worksheet. Microsoft is also tightening the connections between *Excel for OS/2* and products such as the OS/2 version of *AutoCAD*. And *Excel* will ship with an OS/2 version of *Q+E*, an external data query tool.

Because OS/2 provides more font support, the new *Excel* will offer up to 256 fonts instead of just 4. A high-quality font mode and a faster but lower-quality font mode will supported.

Excel for OS/2 will be available for a $50 upgrade fee in the fall. At press time, other prices had not been set.

Wingz for OS/2

Informix's philosophy with *Wingz for OS/2* can be summarized in one word: more. Like its Macintosh cousin, released earlier this year, *Wingz for OS/2* will attempt to surpass *Excel* in three key areas: capacity, presentation capabilities, and application development.

In terms of sheer capacity, *Wingz for OS/2* plans to support huge applications by providing a massive 32,768 by 32,768 matrix, 256 data base sort keys, and up to 30,000 graph points.

Even when compared to *Excel*, *Wingz*'s presentation capabilities are expected to be particularly strong. The program will support 20 graph types and up to 256 fonts and colors, with the option to create custom colors. In addition, the program will support clip art and provide drawing tools such as lines and circles.

Informix also envisions *Wingz for OS/2* as a friendly front end for sophisticated applications. HyperScript, the program's compilable English-like language, will allow users to control the look and feel of custom applications and even *Wingz for OS/2* itself, right down to graphic elements such as menu bars, dialog boxes, and buttons. Informix also plans to market an add-in HyperScript application that permits SQL queries to external data bases.

Informix is expected to announce a ship date for *Wingz* at fall COMDEX. The product will be priced competitively with *1-2-3* and *Excel*.

Anita Amirrezvani is a PC World contributing editor.

Microsoft Excel for OS/2
Microsoft Corp.
16011 N.E. 36th Way
Redmond, WA 98073
206/882-8080
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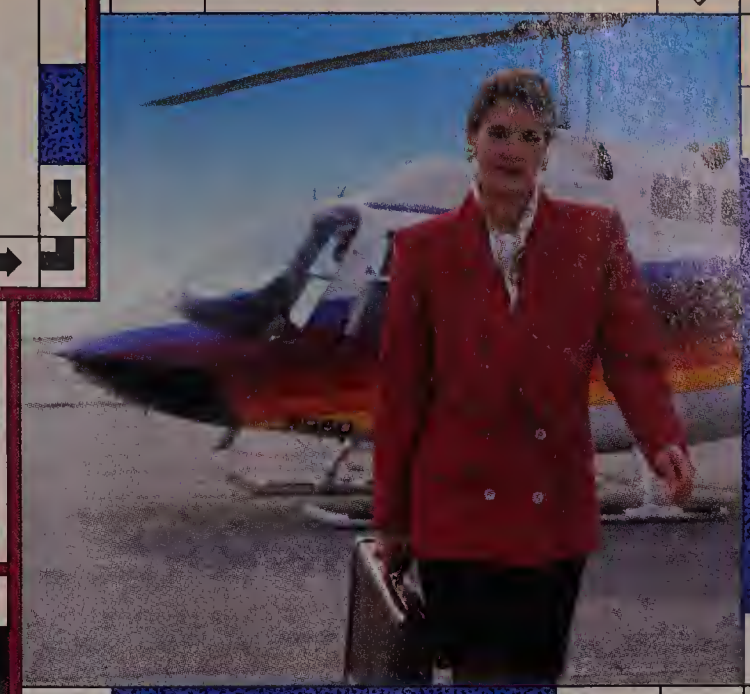

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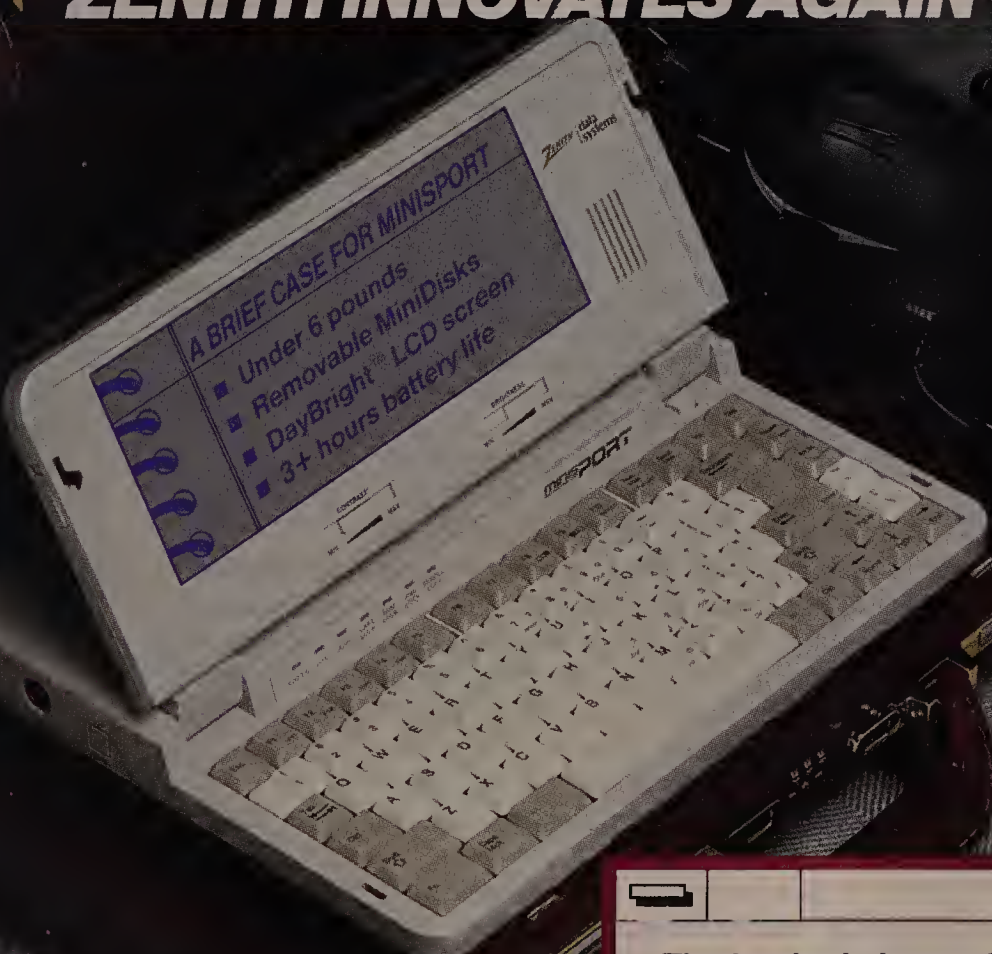

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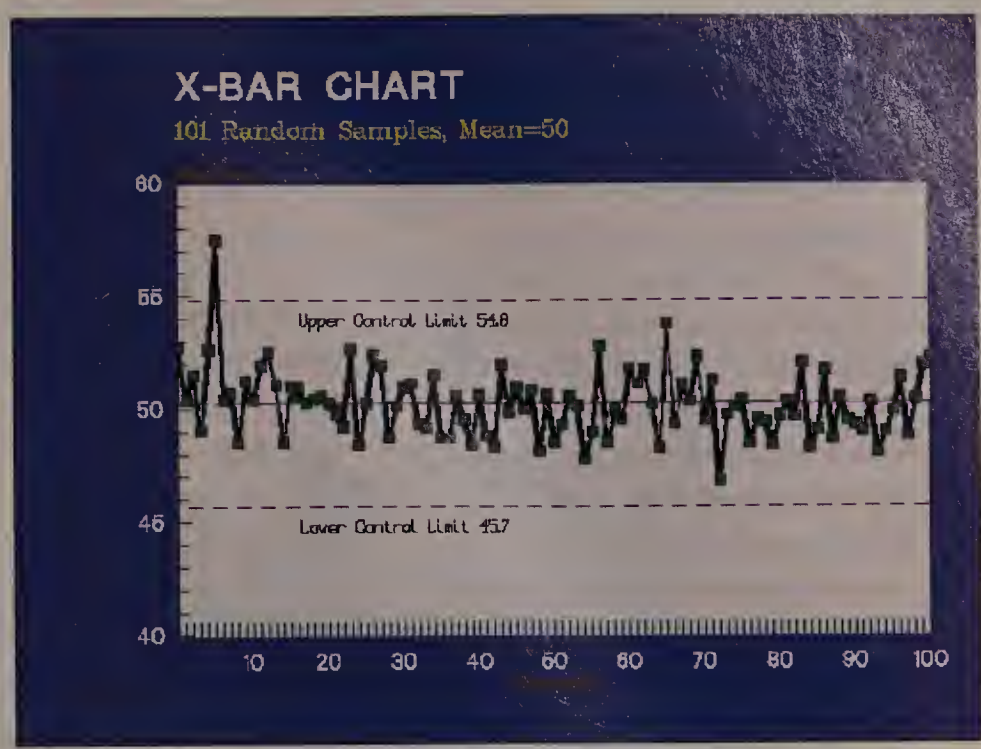
record a macro, for instance, only successful procedures are recorded; if you make a false menu start, the keystrokes are discarded. Thus, macros recorded in *Excel* require much less editing than with *1-2-3*. Macros reside in separate macro files, so you can execute utility macros with any worksheet.

With its accessible *Windows* interface, good-looking reports and graphs, procedural macro language, and excellent help system, *Excel* has mounted the only serious challenge to *1-2-3*. It retains all of those advantages over release 3, while extending its data base abilities with *Q+E*. All that's missing is a true 3-D workspace and a relational data base, making it the ideal choice for users who require superb reporting tools and who favor the graphic interface.

SuperCalc5

Every *1-2-3 2.01* user who has ever muttered under his or her breath, "If only it would..." will probably find what he or she was looking for in *SuperCalc5*. It is festooned with features, from user-defined numeric formats to curvilinear regression. It includes bonuses such as Funk Software's *Sideways* and Computer Associates' own *Spreadsheet Auditor* and *Macro Analyzer*. Its graphing and reporting capabilities are particularly fine. Yet despite all these features, *SuperCalc* is outclassed in application development capabilities by release 3, in usability by *Excel*, and in speed by both.



SuperCalc's superb graphics offer formatting flexibility and precise font and color control.

SuperCalc takes the basic *1-2-3* interface, rearranges the menu structure, and adds lots of options. Here are just a few of many possible examples: You can format not just globally and in ranges but by row and column, with standard or user-defined formats. You can sort by columns or rows, with the option of not readjusting sorted formulas. You can fill a range with a linear, geometric, or date series. When you copy cells, you have the option of indicating cell by cell which formulas should be readjusted. You can even copy one range onto another and add them together.

At first glance, *SuperCalc*'s multiworksheet system is similar to that of Lotus, but differences in the handling of formulas and commands make Lotus's system much more usable. Like *1-2-3*, *SuperCalc* permits multiple "pages" in a single worksheet file, multiple open files, and formula links between an open worksheet and one stored on disk.

But while *1-2-3* permits true 3-D range manipulation between worksheet pages, *SuperCalc* treats each page much like a separate file. For instance, you can anchor and point a 3-D range for some procedures, like building a sum() function, but not for others, like /Move. Range names are strictly 2-D, and while you can paste a range name into a

EXECUTIVE SUMMARY

SuperCalc5
Spreadsheet

SuperCalc5 is like 1-2-3 release 2.01 with lots of extras. It offers particularly good graphics, reports, and editing capabilities. But it's slow compared to the other spreadsheets, it doesn't improve on release 2.01's interface, and its multiworksheet system and data base don't match release 3's.

	POOR	FAIR	GOOD	EXCELLENT
Spreadsheet			●	
Data base		●		
Reporting and graphs				●
Macros			●	
Performance		●		
Overall value			●	

Reader service no. 603

THE DATA BASE CONNECTION

Don't say we didn't tell you so: Recent developments at Lotus and Microsoft prove that spreadsheets are evolving into the universal interface to data (see Richard Landry's column in the May 1988 issue of *PC World*). Take *1-2-3* release 3: Its data base has been fortified with relational capabilities and a full-blown external query system. And, in a competitive thrust and parry, Microsoft has arranged to market Pioneer Software's *Q+E*, an *Excel*-compatible data base query tool for *Windows*.

Why this sudden interest in data bases? The answer combines short-term gadgetry with long-term vision. Right now, *1-2-3*'s data base enhancements provide far more sophisticated handling of worksheet-resident data bases than *Excel*. In the long term, both *1-2-3* and *Excel* promise to support an effortless exchange of data between a central data base server and client spreadsheets running on networked PCs.

SQL's Convincing Story

As the push toward networking intensifies, SQL is emerging as a common language for extracting data from disparate data base management systems. Lotus's Data Lens query system and Pioneer's *Q+E* permit *1-2-3* and *Excel* users, respectively, to generate from a familiar interface a covert SQL command that fetches data from an external data base.

Both *1-2-3* and *Excel* are currently supplied with drivers that access only *dBASE* files, although Microsoft has announced future support for *SQL Server* and OS/2 Extended Edition, and Lotus says that data base drivers from Microrim, Oracle, and Novell are under development. Because actual data base access is handled by the driver, applications using Data Lens or *Q+E* should, in theory, work with future SQL data base systems.

Data Lens in Perspective

Release 3's Data Lens system is a specification for drivers that access external data. Release 3 ships with a sample driver for *dBASE III*, which actually integrates external *dBASE* data tables into the *1-2-3* data base system. A new command menu (/Data External) attaches the *dBASE* driver and opens a data table under a "range" alias. Once opened, the external table works just like an ordinary range; identify it as an input range, and you can extract records from the data base into your spreadsheet.

You can also add records or calculate data base statistical functions, and *1-2-3*'s relational features allow you to join external tables to one another or to worksheet-resident tables. But you can't modify or delete external records, and the driver doesn't support indexes and hasn't been tested for compatibility with *dBASE IV* files. Lotus, which wrote the driver, describes it as merely a sample; the company expects more powerful drivers to be written and maintained by data base vendors.

Q+E's Graphic Approach

Q+E, running under *Windows*, provides *Excel* users with relational access to external *dBASE II, III*, or *IV* files and their indexes. The new version, *2.11*, corrects many of version 2.06's deficiencies (see the *Windows* Special Report, August 1989); it now handles multiple indexes and .MDX files, but it still won't create nested queries. With *Q+E*, you simply open a data base file, then open and use an index. The data base records appear on screen; you can browse them via the scroll bars.

The graphic interface makes queries a breeze. Suppose you have a data base containing customer information for all 50 states. Just click on 'VA' under 'STATE' and choose 'Add Condition' from the Select menu, and a dialog box appears, letting you confirm the query conditions. Select 'OK', and just the records from Virginia remain. You select fields by hiding unwanted columns. To join two tables, simply open them both, select the key field in each, and choose 'Select Join'. The screen shows a results table with fields from both files; you can save the view in a special query file for future use.

You can also copy the data in the results table to *Excel* via the *Windows* Clipboard, or set up a dynamic link so that the worksheet will automatically reflect changes in the data base files. Although you can create similar links in *1-2-3*, *Excel*'s system is slicker.

Q+E's interface is utterly intuitive, and SQL-literate users can enter SQL commands directly. But for *Excel* users there are some drawbacks: *Q+E* works only with external tables, so you can't join with a worksheet-resident data base. And, contrary to *Q+E*'s documentation, you can't perform relational operations if you use the included macro that integrates *Q+E* with *Excel*'s menu system.

The Future Looks Easier

Right now, Lotus power users can devise clever applications with release 3's new data base features, and users of either *1-2-3* or *Excel* who need data from *dBASE* files can access it with the new external query systems. As the technology matures, users will be able to access other data bases and even tap into far-flung data on SQL servers. The spreadsheet, with its familiar interface and wide-ranging analytical power, is the logical point of departure.
—*R. S.*

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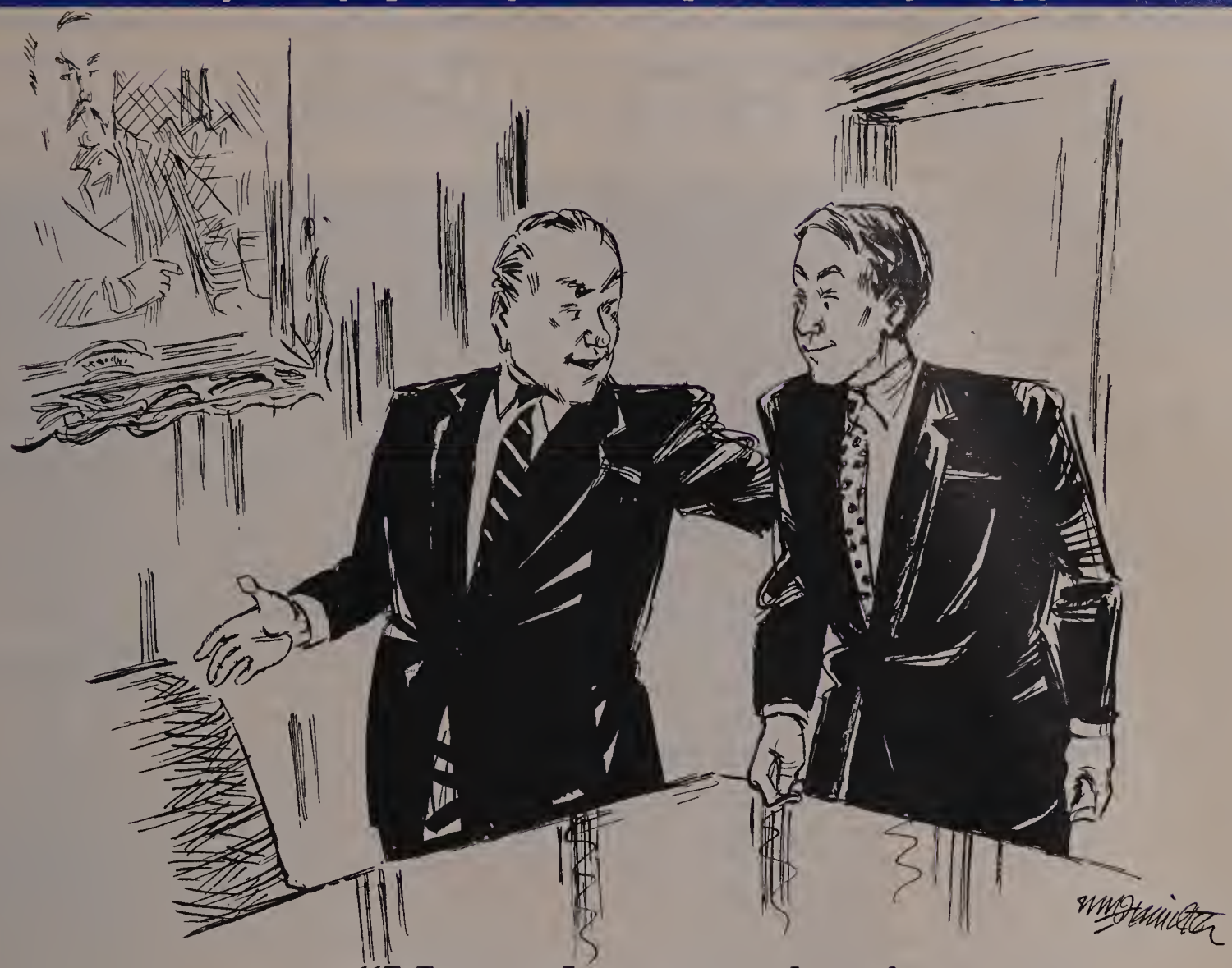

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formula or command, you can't access the range names in another page. This kind of inconsistency makes for a steep learning curve, especially when compared with Lotus's smooth implementation. However, Computer Associates says that an update available in September will extend *SuperCalc*'s 3-D capabilities and also provide speed improvements.

Except for a few minor additions, *SuperCalc*'s data base provides no more than *1-2-3* release 2.01 does. An upcoming upgrade of *Silverado*, the company's $149 pop-up data base, is expected to offer relational capabilities but will lack an external query function.

When it comes to graphing, *SuperCalc5* is just as good as *Excel* and even a bit easier to use. It boasts graph styles from pies to polar coordinates, 3-D effects (but not true 3-axis graphs), double–*y*-axis and mixed pie and column charts, and support for a wide range of output devices. You can't see graphs and spreadsheets on screen together, and you can't place notes and arrows just anywhere on the chart as you can with *Excel*, but handy settings sheets make it easier to customize and modify graphs.

SuperCalc's reports provide the best overall flexibility, with excellent font control, multiple print ranges per page, multiline headers, a grid option, and a width command that measures the width of a print range relative to the margins. A settings sheet for print options makes it easy to keep track of everything. Too bad the print preview for reports is limited to character mode.

For graphics, reports, and editing versatility, *SuperCalc* offers good value. But its interface and application development features are now a generation behind, just like release 2's. As for power and speed, it's no match for release 3.

A User for Every Product

1-2-3 release 2.01 reigned supreme for years; none of the new products has inherited its mandate. But at least now there's an obvious choice.

Unless you've already standardized on *SuperCalc*, the new version just doesn't measure up to the other two spreadsheets. Although it's not a bad product, it's caught between release 3's superior power and *Excel's* better interface. It's slow, too.

If you plan to develop sophisticated data base–access applications for end users or you require powerful application development tools such as 3-D, then release 3 is the best product. For the vast majority of users, however, *Excel*'s graphic interface and advanced reporting capabilities signal a better direction. That's why *Excel* earns our Best Buy award. ●

Richard Scoville is director of curriculum and development for The Office Works Training Centers in Research Triangle Park, North Carolina.

For more information about all products in this article, circle reader service no. 901.

WHERE TO BUY

1-2-3 release 3
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
617/623-6572
LIST PRICE: $495 until January 1, 1990, $595 thereafter; upgrade from any previous release $150, free upgrade from releases purchased after September 6, 1988
REQUIREMENTS: 1MB, 3MB with OS/2 (4MB recommended), DOS 3.0 or later version, 80286 or 80386 processor, EGA or VGA graphics to view text and graphics together
TECHNICAL SUPPORT: for six months 24-hour toll-free number; after six months, unlimited, no toll-free number, M–F 8:30–8, priority support available for a fee
OTHER SUPPORT: CD PROMPT (a support data base) on CD-ROM, Extended Application Facility tool kit for add-in and corporate developers
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Excel 2.1
Microsoft Corp.
16011 N.E. 36th Way
Redmond, WA
98073-9717
800/426-9400,
206/882-8088
LIST PRICE: $495, $75 rebate if you upgrade from competing spreadsheet; Q+E $10 to new Excel users, $49.95 to registered Excel users
REQUIREMENTS: 640K, DOS 3.0 or later version, 80286 or 80386 processor, EGA or VGA display, Windows 2.0 for some operations
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SuperCalc5
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San Jose, CA 95131
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408/432-1727
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REQUIREMENTS: 512K (640K recommended), DOS 3.0 or later version
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Seven Printers With Business Sense

Looking for a versatile office printer?

Our survey of under-$1000 24-pin dot matrix printers finds good value the rule rather than the exception.

Steve King

If you need a printer that can tackle business letters, internal reports, and occasional multipart forms, then a 24-pin dot matrix printer is for you. Unlike cheaper printers that sell for less than $500 (see "Solid Bargains in Personal Printers," *PCW*, June 1989), midrange 24-pin printers offer higher speed, superior text and graphics output, and the ability to handle envelopes, labels, and multipart forms with ease.

This review examines seven 24-pin dot matrix printers that cost between $699 and $999: the Alps ALQ224e, the C.Itoh ProWriter C610, the Epson LQ-850, the IBM Proprinter X24E, the wide-carriage Mannesmann Tally MT222, the Okidata Microline (ML) 390, and the Toshiba P321SLC.

Picking a 24-Pin Printer

High-quality output is a 24-pin printer's raison d'être; such a printer should be able to produce crisp, correspondence quality output and good-looking graphics. Of the seven printers reviewed, four tied for top output honors when tested with a 10-pitch Courier font: the C.Itoh ProWriter C610, the IBM Proprinter X24E, the Okidata ML 390, and the Toshiba P321SLC.

Most of the printers produced good business graphics at a resolution of 360 by 180 dots per inch (dpi), but their output is probably more appropriate for internal reports than for presentations. Only two printers, the Mannesmann Tally MT222 and the Epson LQ-850, produced poor graphics.

You won't need to pitch a tent waiting for these devices to finish a print job, but only one of them is particularly fast—the Okidata ML 390, which placed first in all the National Software Testing Laboratories (NSTL) speed tests for text printing. The Alps ALQ224e was the clear second-place winner in almost every test; the other printers turned in mixed results.

For everyday office duty, error-free paper handling is critical. All seven printers offer such niceties as paper parking, auto paper feed, and top-of-form alignment; and all of them handle multipart forms adequately. The Toshiba P321SLC is the only printer in the bunch that doesn't do labels. The Okidata ML 390 and the Alps ALQ224e offer bottom-feed options, which are useful for thick items. The C.Itoh C610's flatbed design provides the same advantages at no extra cost.

Likewise, all seven can handle envelopes with ease, but the special features of the IBM Proprinter X24E and the C.Itoh C610 make them standouts in this category. The Proprinter provides a special front slot that allows you simply to slide envelopes into the printer; the C.Itoh's design makes envelope printing virtually jam-free.

The seven printers' typographic features are also similar. All of them work with downloadable fonts, and all except the IBM Proprinter support plug-in font cards. Other common typographic features include condensed print, extra-wide print, proportional spacing, and a choice of several character pitches.

If you require color output, the choice narrows to four printers. The Alps ALQ224e and the Toshiba P321SLC come ready to print in seven colors, while the C.Itoh C-610 and the Mannesmann Tally MT222 have an optional color module.

You won't have any problem finding software support for these printers, either. All emulate either the Epson LQ series or the IBM Proprinter X24 command sets. The Okidata ML 390 and C.Itoh C610 come standard with both Epson and IBM emulations. The Toshiba P321SLC is the most flexible: It has its own popular native command set, comes standard with IBM emulation, and offers Epson emulation as an option. The IBM doesn't provide Epson emulation or vice versa.

Last but not least, hassle-free controls are critical. Except for the Epson, all the printers do away with DIP switches to control

The Okidata ML 390's excellent output, speedy text printing, and ample features mean first-rate 24-pin printing (photo on left).

ROBERT CARDIN

FEATURES EVALUATION

Office-Duty Printing at a Reasonable Price

All the printers here offer comparable features, but the Okidata ML 390 adds winning print speed, high-caliber output, and the lowest price to earn a Best Buy rating.

● Yes
○ No
◒ Deficient

	Alps ALQ224e	C.Itoh ProWriter C610	Epson LQ-850	IBM Proprinter X24E	Mannesmann Tally MT222	Okidata ML 390	Toshiba P321SLC
Standard features							
Standard-carriage price	$875	$799	$849	$899	n/a	$699	$899
Wide-carriage price	$1095	n/a	$1199	$1199	$999	$949	$949
Buffer size	23K	32K	6K	14K	8K	23K	32K
Maximum buffer size	87K	32K	38K	14K	8K	23K	64K
Serial port	◒[1]	◒[1]	◒[1]	◒[1]	●	◒[1]	●
Parallel port	●	●	●	●	●	●	●
Paper handling							
Auto paper feed	●	●	●	●	●	●	●
Forms parking	●	●	●	●	●	●	●
Push tractor	●	●	●	○	●	●	●
Pull tractor	●	○	◒[1]	●	○	◒[1]	○
Tear bar	●	●	●	●	●	●	●
Envelopes	●	●	●	●	●	●	●
Labels	●	●	●	●	●	●	○
Multipart forms (number of parts)	4	5	4	4[2]	4	4	4
Bottom feed	●	○	○	○	○	◒[1]	○
Sheet feeder	◒[3]	◒[1]	◒[3]	◒[1]	◒[1]	◒[1]	◒[3]
Front panel controls							
Pitch	●	●	●	●	●	●	●
Font selection	●	●	●	●	●	●	●
Line spacing	●	●	●	●	●	●	●
Page length	●	●	○	○	●	●	●
Micro linefeed	●	●	●	●	●	●	○
Margins	●	●	○	○	●	●	○
Typographic features							
Resident typefaces	2	1	2	2	2	2	3
Font cartridges	●	●	●	○	●	●	●
Downloads fonts	●	●	●	●	●	●	●
Condensed print	●	●	●	●	●	●	●
Italics	●	●	●	○	●	●	○
Graphics resolution (dots per inch)	360x180	360x180	360x180	360x180	360x180	360x360	360x360
Color	●	◒[1]	○	○	◒[1]	○	●
Emulation modes							
Epson FX	●	○	●	○	○	○	○
Epson LQ	●	●	●	○	●	●	◒[1]
IBM Proprinter X24	○	●	○	●	●	●	●
Epson JX	●	●	n/a	n/a	n/a	●	◒[1]
Toshiba/Qume	○	○	○	○	○	○	●

[1] Extra-cost option.
[2] Requires optional pull tractor.
[3] Dual-bin sheet feeder optional.

setup, using a menu system that shows up either on a panel-mounted LCD display or on a printout. You'll have to use your ears with the IBM Proprinter, however, since it uses musical tones to indicate setting changes.

Okidata Microline (ML) 390

Excellent output for draft, letter quality, and graphics printing; the best overall speed; good paper-handling capabilities; and the lowest price of the printers reviewed ($699) earn the Okidata ML 390 a Best Buy rating.

The ML 390's paper-handling apparatus does everything well, although it's outclassed in design by the C.Itoh C610 and the IBM Proprinter X24E. An optional $49 pull tractor supports bottom feeding of continuous multipart forms and labels, which makes handling these awkward items easier.

EXECUTIVE SUMMARY

Okidata Microline 390

24-pin dot matrix printer

Excellent speed, top-quality output, and a relatively low price tag make the ML 390 a Best Buy. The optional $49 pull tractor makes good paper-handling capabilities even better.

	POOR	FAIR	GOOD	EXCELLENT
Print quality				●
Speed				●
Paper handling			●	
Front panel controls			●	
Typographic features			●	
Overall value				●

Reader service no. 695

At 360 by 360 dpi, the Okidata's graphics resolution is higher than most, but its graphics printing speed doesn't match its text printing abilities: It finished second and third in NSTL's two bar-chart tests.

The ML 390 is easy to use, and its well-designed control panel offers complete manual control over the printer's setup. By switching from print to setup mode, you can print a list of the unit's settings and then easily reset them by pressing few buttons.

The Okidata ML 390's outstanding features and superior speed make it the best all-around printer in this review.

The Alps ALQ224e offers good speed, solid construction, and color output. For sans serif text, it's a worthy printer.

ROBERT CARDIN

C.Itoh ProWriter C610

Along with the IBM, the Alps, and the Toshiba, the C.Itoh ProWriter C610 falls into the middle tier when it comes to value. Each

EXECUTIVE SUMMARY

C.Itoh ProWriter C610

24-pin dot matrix printer

The C610 is no speed demon, but it did well in our ratings thanks to its excellent print quality and paper-handling capabilities.

	POOR	FAIR	GOOD	EXCELLENT
Print quality				●
Speed		●		
Paper handling				●
Front panel controls		●		
Typographic features			●	
Overall value			●	

Reader service no. 691

NSTL TEST REPORT

Okidata Leads the 24-Pin Parade

The ML 390 wins six of eight speed tests—and the price is right.

IBM Emulation

Plain draft text

Okidata ML 390	300
Alps ALQ224e	330
C.Itoh C610	381
Toshiba P321SLC	385
IBM Proprinter X24E	484
Mannesmann Tally MT222	528
Epson LQ-850	n/a[1]

Plain letter quality text

Okidata ML 390	606
Alps ALQ224e	687
C.Itoh C610	836
Mannesmann Tally MT222	854
Toshiba P321SLC	877
IBM Proprinter X24E	1100
Epson LQ-850	n/a[1]

Enhanced letter quality text

Okidata ML 390	114
Alps ALQ224e	149
Mannesmann Tally MT222	218
IBM Proprinter X24E	221
Toshiba P321SLC	229
C.Itoh C610	272
Epson LQ-850	n/a[1]

Bar chart

Alps ALQ224e	190
Okidata ML 390	192
C.Itoh C610	250
IBM Proprinter X24E	311
Toshiba P321SLC	347
Mannesmann Tally MT222	540
Epson LQ-850	n/a[1]

seconds 0 225 450 675 900

Epson Emulation

Plain draft text

Okidata ML 390	300
Alps ALQ224e	322
C.Itoh C610	371
Epson LQ-850	385
Toshiba P321SLC	390
Mannesmann Tally MT222	531
IBM Proprinter X24E	n/a[2]

Plain letter quality text

Okidata ML 390	605
Alps ALQ224e	676
C.Itoh C610	725
Mannesmann Tally MT222	855
Toshiba P321SLC	875
Epson LQ-850	902
IBM Proprinter X24E	n/a[2]

Enhanced letter quality text

Okidata ML 390	107
Alps ALQ224e	143
Epson LQ-850	154
Mannesmann Tally MT222	164
Toshiba P321SLC	220
C.Itoh C610	262
IBM Proprinter X24E	n/a[2]

Bar chart

Epson LQ-850	110
Alps ALQ224e	156
Okidata ML 390	159
Toshiba P321SLC	207
C.Itoh C610	315
Mannesmann Tally MT222	398
IBM Proprinter X24E	n/a[2]

seconds 0 225 450 675 900

[1] The Epson LQ-850 has Epson emulation only.
[2] The IBM Proprinter X24E has IBM emulation only.

Methodology
All tests were conducted using a 12-MHz Compaq Deskpro Model 40 equipped with a VGA monitor and 1.2MB of RAM. The output from the various application programs was captured using a file capture program, and during the actual test the output files were copied to the computer's parallel port from a 512K RAM disk using the DOS COPY command. The results are faster than could be expected printing directly from an application program because the overhead from the application program has been eliminated.

Plain draft text
This benchmark times the printing of plain text in draft mode. The test file contained 19 pages of text without enhancements; it was printed with *Microsoft Word* using the TTY driver.

Plain letter quality text
This benchmark times the printing of plain text in letter quality mode. The same procedure used for the plain draft text benchmark was used for this benchmark, except that the printers were set to letter quality mode.

Enhanced letter quality text
This benchmark times the printing of four pages of text enhanced with bold-facing, underlining, superscripts, and italics, in letter quality mode.

Bar chart
This benchmark measures the time required to print a 7-by-5-inch clustered bar chart created in *1-2-3*, with the program set for high-density printing. The printers were tested in their Epson LQ modes (using Lotus's LQ-1500 driver) and in their IBM emulation modes (using Lotus's IBM Proprinter driver).

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

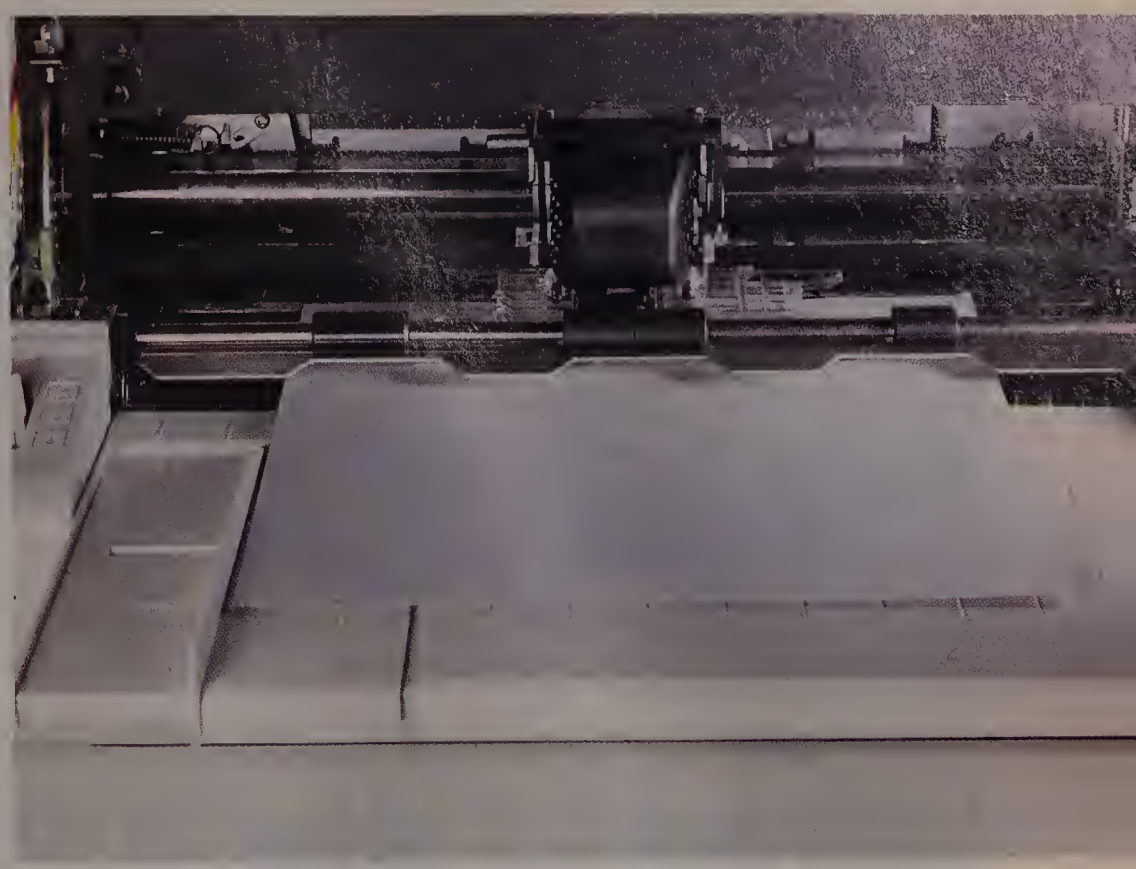
unit offers distinct advantages and disadvantages. The C.Itoh, for example, is not particularly fast compared to the Okidata or Alps; but at $799, it offers good-looking output and sturdy paper-handling capabilities, due to its flatbed paper-feeding design.

The flatbed technology lets paper enter and exit the printer directly without wrapping around a platen. Continuous fanfold paper enters the rear of the C610; single cut sheets and envelopes slide in the front. You can easily load either type of paper or both together, and it's easy to line up envelopes for accurate printing.

It's fortunate that the C610's flatbed design makes the printer so easy to use, because its documentation is the worst of all the printers reviewed. The LED menus that appear on the control panel are also rather cryptic at first, requiring frequent reference to the manual and command card.

Unlike the other printers, the C610 comes with only one resident typeface, Courier, in only one size, 10 pitch. It does support optional font cartridges, however, and you can also purchase an optional color module.

The ProWriter doesn't match the Okidata ML 390 for speed. In fact, it's much slower than the other printers in one key area: enhanced letter quality output. But the unit's excellent draft, letter quality, and graphics output and its flawless paper-handling capabilities make it a worthy alternative to the Okidata for a few dollars more.



The C.Itoh ProWriter C610's flatbed paper feed mechanism eliminates the platen for jam-free paper handling.

EXECUTIVE SUMMARY

IBM Proprinter X24E

24-pin dot matrix printer

Although it's a poky printer, the X24E garnered a good rating thanks to great print quality and excellent paper-handling features. But the high price tag makes other printers better values.

	POOR	FAIR	GOOD	EXCELLENT
Print quality				●
Speed		●		
Paper handling				●
Front panel controls			●	
Typographic features			●	
Overall value			●	

Reader service no. 693

IBM Proprinter X24E

Like the C.Itoh, the IBM Proprinter X24E earns a good rating in overall value because of its fine print quality and paper handling. Be aware, though, that it's not especially fast, while its hefty $899 price tag ties it with the Toshiba P321SLC as one of the most expensive narrow-carriage devices reviewed.

The X24E looks conventional from the outside, but it, like the C.Itoh, features a design twist that gives it reliable paper-handling capabilities. A built-in tractor feed sits where the platen is usually located—a unique arrangement that makes loading cut sheets and envelopes a breeze.

After parking the fanfold paper, you can simply insert a single sheet or envelope through a slot in the lower front of the unit. On the whole, IBM's approach to single-sheet feeding allows greater ease of use than do the other printers reviewed, but the IBM is

TONY CARLSON

Good-looking dot matrix output is in the eye of the beholder, but in our opinion the Okidata, the C.Itoh Prowriter, the IBM Proprinter, the Alps, and the Toshiba all print top quality text. Graphics is more of a mixed palette, but all five printers produce output that's adequate for office use. In this review, only the Epson and the Mannesmann Tally produced anemic hard copy.

not quite as adept as the C.Itoh at handling multipart forms and labels.

The Proprinter's panel controls take some getting used to and require manual dexterity as well as a good ear. When you change a setting, the printer issues musical tones to let you know what's happening. Although the X24E doesn't offer as many setup options as the other printers tested, it does provide adequate manual control over font size and typefaces.

In our opinion, the X24E's exceptional paper handling, good print quality, and middling speed do not make it worth $200 more than the Okidata—unless you place a high value on the "Made in the USA" label.

Alps ALQ224e

The Alps ALQ224e has a divided personality. It finished second in text printing

EXECUTIVE SUMMARY

Alps ALQ224e

24-pin dot matrix printer

Although the ALQ224e rated second fastest in speed tests, its text output quality gets mixed reviews: an excellent sans serif typeface, but only fair Courier.

	POOR	FAIR	GOOD	EXCELLENT
Print quality			●	
Speed			●	
Paper handling			●	
Front panel controls				●
Typographic features			●	
Overall value			●	

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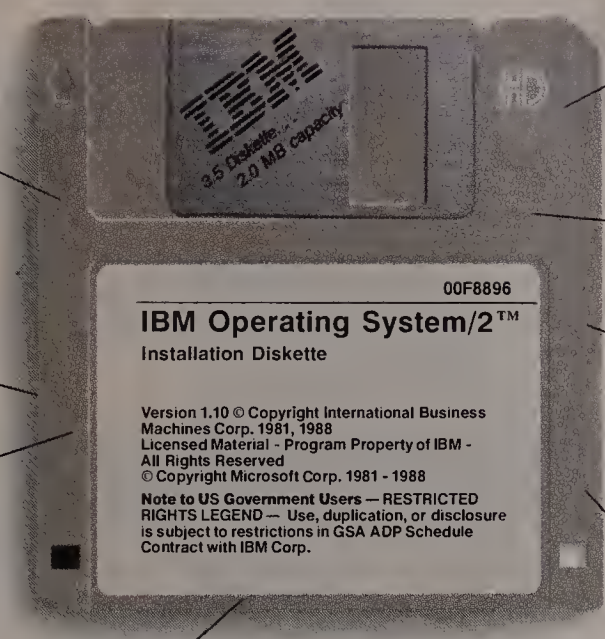

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speed tests, but its Courier font output was drab compared to that of the top four contenders. On the other hand, it offers an excellent letter quality sans serif Gothic font, so we judge the Alps a good overall value as long as you don't mind a sans serif font.

The $875 ALQ224e is the largest, heaviest printer in the group. A peek under its cover is like a return to those bygone days when most of a printer's internal components were made of metal. If looks are any indication, you can count on the ALQ224e for durability.

The Alps uses a push/pull tractor system that provides precise paper handling, but until you adapt to the device, tractor paper is tricky to load.

Of the printers reviewed, the Alps has the control panel with the most complete series of buttons and indicator lights. The printer also comes with Alpsmate, a software setup utility that's a subset of MicroLogic Software's popular *PrintMate* printer-control program. Alpsmate makes it easy to set up the ALQ224e for programs that don't have 24-pin printer drivers.

The ALQ224e also offers good seven-color printing and would have rated higher in this review if not for its poor Courier output. But if the sans serif Gothic font is acceptable, the ALQ224e is a very good choice. It sure is fast.

Toshiba P321SLC

Although its output compares well with the other printers', the Toshiba P321SLC doesn't match the speed of the Okidata or the paper-handling prowess of the C.Itoh or IBM. At $899 it's also pricey, but its built-in color printing is top drawer.

The P321SLC's push tractor is tricky: Unless you're very careful when you load fan-fold paper, the system jams. But the Toshiba has added paper-handling muscle in the form of an optional $249 dual-bin sheet feeder.

The P321SLC's control panel is well designed; its 16-character LED display shows all printer settings and guides the user through an easily understood menu system for specifying default settings.

EXECUTIVE SUMMARY

Toshiba P321SLC

24-pin dot matrix printer

The P321SLC contrasts excellent print quality with middling speed. But its striking color output can add pizzazz to presentation graphics.

	POOR	FAIR	GOOD	EXCELLENT
Print quality				●
Speed		●		
Paper handling			●	
Front panel controls			●	
Typographic features			●	
Overall value			●	

Reader service no. 696

The Toshiba comes with IBM Proprinter X24E emulation and has optional Epson LQ series and Diablo 630 emulation cards. You can also opt for the P321SLC's native Toshiba/Qume command set, which accesses the 360-by-360-dpi graphics mode and is supported by most software.

To its credit, the P321SLC offers good output and easy-to-use controls. It's not particularly fast, though, nor as adept at paper handling as some of the other printers. But because it offers excellent color printing, we judge it a reasonably good value for those who need this option.

Epson LQ-850

The Epson and the Mannesmann Tally rank last. Although Epson helped popularize 24-pin printers, with the LQ-850 the company seems to be resting on its laurels. At $849, the LQ-850 is relatively high priced without offering enough to justify its cost. The printer's letter quality text looks faded, graphics output is similarly anemic, and its pace, except for graphics printing, is middle-of-the-road at best.

The LQ-850 features adequate, if unexciting, paper handling. An optional pull tractor handles multipart forms, but there's no bottom feed. On the other hand, the LQ-850 is

A peek under the cover of the ALQ224e is like a return to those bygone days when a printer's internal components were made of metal.

Particularly noteworthy is the Epson LQ-850's documentation, which explains how to set up 11 popular programs.

EXECUTIVE SUMMARY

Epson LQ-850

24-pin dot matrix printer

Unlike the other printers, the LQ-850 uses old-fashioned DIP switches for some printer settings. Its output looks faded, and its speed is only moderate; for the relatively high price, this printer is no bargain.

	POOR	FAIR	GOOD	EXCELLENT
Print quality			●	
Speed			●	
Paper handling				●
Front panel controls			●	
Typographic features				●
Overall value			●	

Reader service no. 692

one of the three printers reviewed that offer an optional dual-bin sheet feeder.

Moreover, its documentation is the best of any printer in this review. Particularly noteworthy is the *Application Notes* manual, which explains how to set up 11 popular software packages.

Although its panel controls are easy to use, the LQ-850 is the only one of the printers that requires you to change old-fashioned DIP switches to alter default settings. Overall, Epson hasn't really provided anything to make the LQ-850 worth considering, especially given its hefty price tag. Other printers offer better value.

Mannesmann Tally MT222

The good-looking Mannesmann Tally MT222, available only in a $999 wide-carriage model, suffers from two fatal flaws: Its output is shoddy, and it's slow.

The MT222's draft quality text is fine, but its letter quality Courier text is faint and uneven, and the blacks in its graphics are light. Equally troubling, the MT222's speed rated consistently near the bottom, coming in next to last in half the speed tests.

The printer's paper-handling system is dependable, however. The standard push tractor is easy to use and works well. And the MT222's printed list of menu settings is simple to learn.

But these features aren't enough to compensate for poor output quality and slow speed. Considering the price, you should probably look elsewhere.

The Last Word

Our evaluation of the seven printers focused on output quality, speed, and paper handling, in that order. The Okidata Microline 390 emerged as the clear winner and Best Buy.

The second tier is a mixed bag. The C.Itoh ProWriter C610 and the IBM Proprinter X24E came in much slower than the Okidata in speed trials, but both offer compensations, including crisp output and superb paper-handling design. The Alps ALQ224e turned in the second-fastest performance, but it doesn't offer a good Courier font. If you like its sans serif, however, it's a good value. The Toshiba P321SLC, on the other hand, isn't fast but offers some of the best color printing.

EXECUTIVE SUMMARY

Mannesmann Tally MT222

24-pin dot matrix printer

Available only in a wide-carriage model, the MT222 offers skillful paper handling, but its so-so print quality and paar speed are serious drawbacks.

	POOR	FAIR	GOOD	EXCELLENT
Print quality			●	
Speed		●		
Paper handling				●
Front panel controls				●
Typographic features				●
Overall value			●	

Reader service no. 694

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Circle 38 on reader service card

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Steve King, a freelance writer in Ramona, California, specializes in printers.

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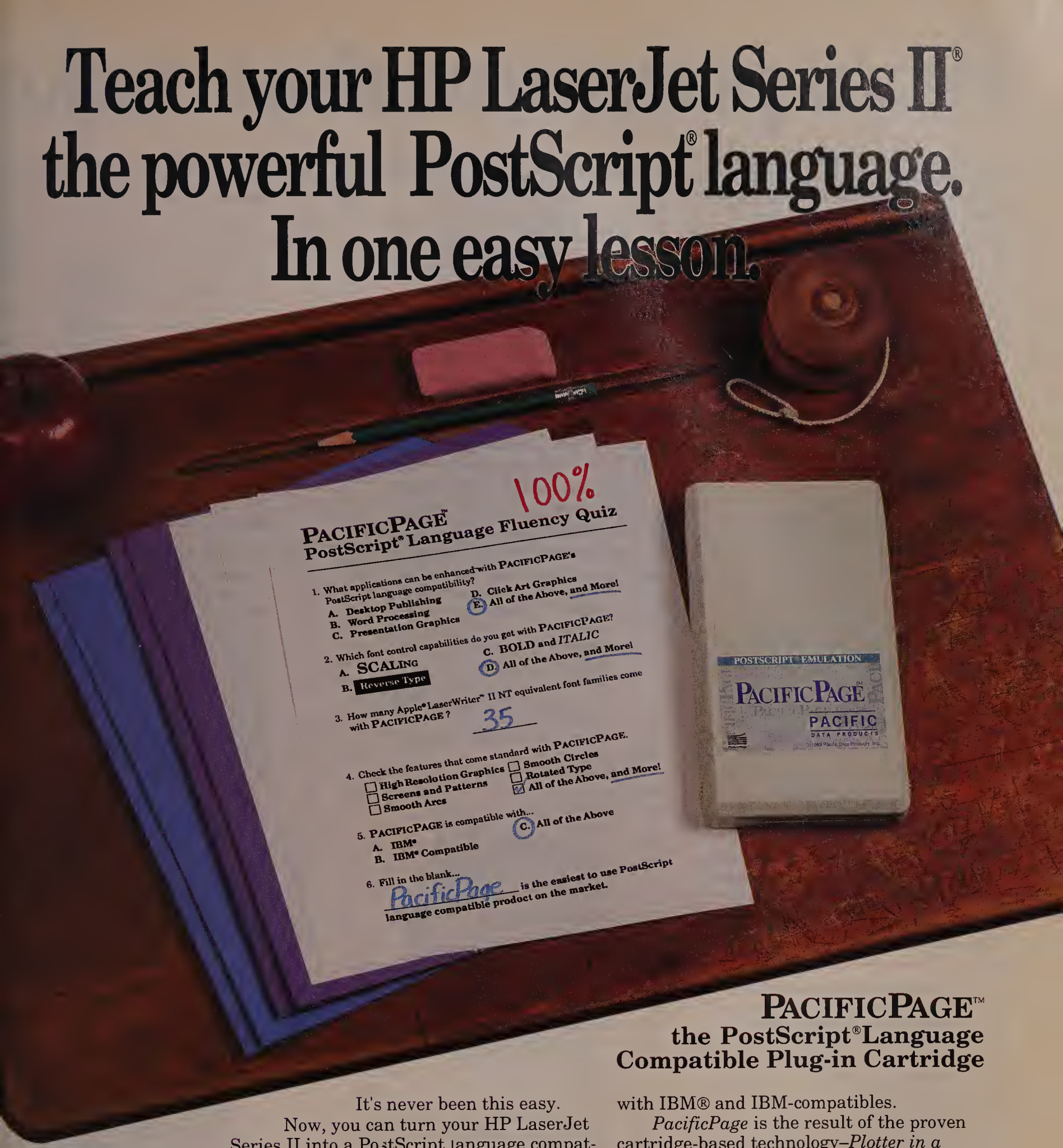

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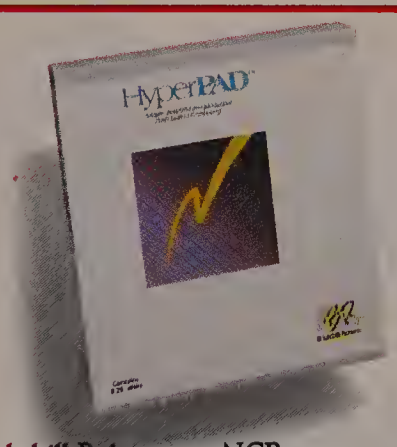

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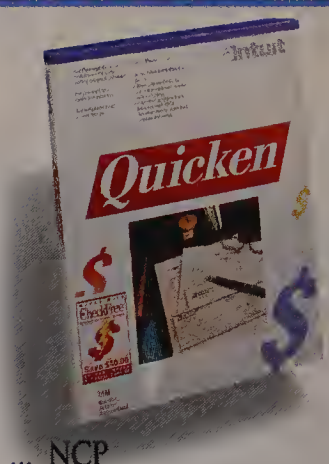

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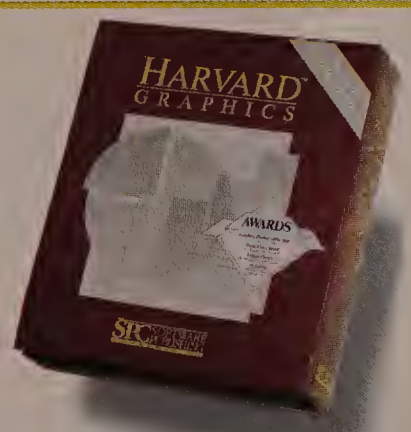

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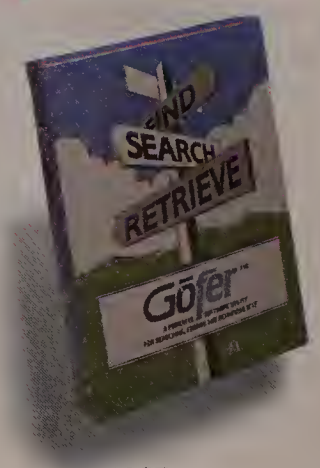

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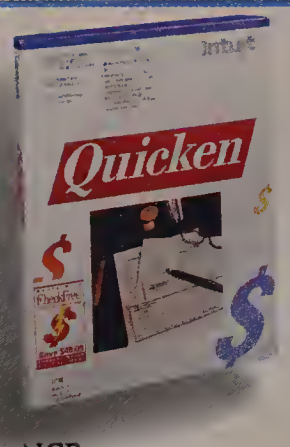

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▣*Quicken 3.0*–Slash the time spent on your finances by automating your routine financial tasks. Get the full picture with flexible, comprehensive reports such as balance sheets, net worth statements and more. . . . . $39.

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5046 ▣Volkswriter 4 *(w/Correct Grammar)* 109.

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3799 ▣WordPerfect Library 2.0 . . . . . 75.
3798 ▣WordPerfect Executive 1.0 . . . . . 145.
3804 □WordPerfect 5.1 . . . . . 265.
3805 ▣WordPerfect Network 5.1 . . . . . 389.
3806 Additonal Network Stations 5.1 . . . . 89.

WordStar USA ... NCP
2825 □WordStar Prof. Release 5.5 . . . . 229.
5000 □*Upgrade to Release 5.5* . . . . . 89.

Wordtech ... NCP
3810 □DBXL 1.3 . . . . . 145.

Xerox ... NCP
4539 ▣Professional Extensions 1.0 . . . . 399.
3812 □Ventura Publisher 2.0 . . . . . call

XTREE Co. ... NCP
4512 ▣XTREE Pro 1.1 . . . . . 69.

XYQUEST ... NCP
4393 □XyWrite III Plus 3.55 . . . . . 229.

RECREATIONAL/EDUCATIONAL

Broderbund ... CP
1413 □Where/World Carmen Sandiego? . . 25.
1414 □Where/USA Carmen Sandiego? . . . 25.
1417 □Where/Europe Carmen Sandiego? 29.
4948 ▣JetFighter *(by Velocity)* . . . . . 35.

Electronic Arts ... CP
5698 □Abrams Battletank . . . . . 29.
5699 □Indiana Jones Graphic Adventure 35.
4804 ▣Life and Death . . . . . 35.
4659 ▣Chessmaster 2100 . . . . . 35.
5700 ▣Cribbage/Gin King . . . . . 42.

Microprose ... CP
4454 □F-19 Stealth Fighter . . . . . 39.
2725 □F-15 Strike Eagle . . . . . 22.

Microsoft ... NCP
2858 □Flight Simulator 3.0 . . . . . 35.

Mindscape ... CP
4897 □Gauntlet . . . . . 29.
2752 ▣Balance of Power 1990 . . . . . 33.

Parlor Software ... CP
3159 □Bridge Parlor 2.3 . . . . . 49.

Sierra On-Line ... CP
3405 ▣Thexder . . . . . $24.
4752 ▣Gold Rush . . . . . 25.
4455 ▣Leisure Suit Larry II . . . . . 33.
4345 ▣King's Quest IV *(512k version)* . . . 33.
5695 ▣Manhunter: San Francisco . . . . . 33.
4456 ▣Police Quest II . . . . . 33.
3404 ▣Space Quest II . . . . . 33.

Spectrum Holobyte ... NCP
3467 ▣Tetris *(addicting mind teaser)* . . . . 24.
4283 ▣Falcon/AT *(F-16 simulation)* . . . . . 32.
5187 ▣VETTE! . . . . . 32.

Stone & Assoc. ... NCP
3436 ▣Memory Master *(ages 2-6)* . . . . . 22.
3435 ▣My Letters,Numbers,Words *(2-6)* 22.
5231 ▣Phonics Plus . . . . . 22.
3439 □2nd Math *(ages 7-16)* . . . . . 27.

Sublogic ... NCP
4653 □Up Periscope . . . . . 25.
3335 □Jet *(requires CGA or EGA)* . . . . . 33.

True BASIC, Inc. ... NCP
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Manufacturer's standard limited warranty period for items shown is listed after each company name. Some products in their line may have different warranty periods.

AST Research ... 2 years
1223 I/O Mini 2 C/S/P . . . . . 89.
1302 SixPakPlus 64k C/S/P . . . . . 129.
4107 RAMpage Plus 286 512k . . . . . 419.
4105 RAMpage Plus MicroChannel 512k 469.

Central Point ... 1 year
5042 Copy II PC Deluxe Option Board . . 115.

Compucable ... 2 years
1604 2-Position switch box . . . . . 25.
1605 3-Position switch box . . . . . 35.

Cuesta ... 1 year
1608 Datasaver 400 Watt *(power backup)* 429.

Curtis ... lifetime
1681 Curtis Clip CC-1 . . . . . $6.
1686 Disk Holder DB-1 . . . . . 8.
1718 3½" Disk Holder DB-2 . . . . . 8.
1704 Printer Stand PS-1 . . . . . 18.
1713 Filtered SafeStrip SPF-3 . . . . . 24.
1678 Universal System Stand SS-3 . . . . . 25.
1694 Emerald SP-2 . . . . . 36.
1707 Ruby SPF-2 *(6 outlets; EMI/RFI filtered; 6 ft cord)* . . . . . 55.
1708 Ruby-Plus SPF-2 Plus *(w/FAX & modem protection)* . . . . . 65.

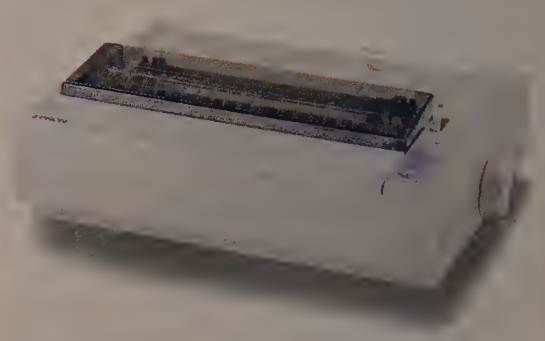
DacEasy ... 1 year
3211 Breakthru 286-8 *(8 MHz accelerator)* . . . . . 225.
3210 Breakthru 286-12 *(12 MHz accelerator)* . . . . . 349.

Epson ... 1 year
We are an authorized Epson Service Center.
1906 FX-850 *(80 col., 264 cps, 9 pin)* . . . call
1904 FX-1050 *(136 col., 264 cps, 9 pin)* . . call
5183 LQ-510 *(80 col., 180 cps, 24 pin)* . . 349.
1930 LQ-850 *(80 col., 264 cps, 24 pin)* . . call
4117 LQ-950 *(110 col., 220 cps, 24 pin)* . . call
1917 LQ-1050 *(136 col., 264 cps, 24 pin)* call
4116 LQ-2550 *(136 col., 333 cps, 24 pin)* call
5184 LX-810 *(80 col., 180 cps, 9 pin)* . . . 199.
1052 Printer-to-IBM cable *(6 feet)* . . . . . 15.
We carry a full line of Epson accessories and ribbons. Call us with your needs.

5th Generation ... 1 year
3952 Logical Connection 512k . . . . . 529.
4921 Logical Connection 1 Meg . . . . . 659.

Hayes ... 2 years
2304 Smartmodem 1200 . . . . . 289.
2305 Smartmodem 1200B *(w/Smartcom II)* 289.
2306 Smartmodem 1200B *(hardware only)* 259.
2307 Smartmodem 2400 . . . . . 429.
2308 Smartmodem 2400B *(w/Smartcom II)* 429.
2309 Smartmodem 2400B *(hardware only)* 399.

Hercules ... 2 years
2318 Graphics Card Plus . . . . . 189.
5120 VGA Card . . . . . 189.



Epson ... 1 year
LQ-510 Printer–Makes high quality 24 pin printing affordable. Includes push tractor and Epson's exclusive SmartPark paper handling features standard. 180 cps draft, 60 cps LQ (12 cpi mode) . . . . . $349.

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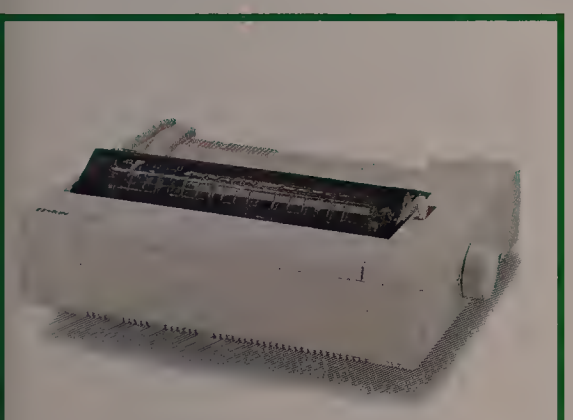
4696	2400B Internal Modem	$159.
2352	2400B Internal Modem 2 *(for PS/2)*	249.
5119	2400 Baud External Modem	179.
2346	Inboard 386/PC w/1 Meg	599.
4646	Inboard 386/PC Piggyback 4 Meg	1249.
2339	Inboard 386/AT *(req. inst. kit)*	859.
2338	Inboard 386/AT Installation Kit	139.
4266	Above Board Plus 512k	419.
4267	Above Board Plus I/O 512k	449.
5336	Above Board Plus 8 2 Meg	869.
5342	Above Board Plus 8 I/O 2 Meg	899.
4272	Above Board 2 Plus 512k	469.
4339	Above Board Plus Piggyback w/2 Meg *(upgrades to 6 Meg)*	call
4275	Connection Coprocessor	769.
4857	Visual Edge *(improve the output of your HP Laserjet II)*	449.
	MATH COPROCESSORS	
2375	8087 *(for IBM-PC & XT)*	89.
2374	8087-2 *(for 8 MHz 8088 CPU's)*	129.
2368	80287 *(for 6 MHz 80286 CPU's)*	135.
2370	80287-8 *(for 8 MHz 80286 CPU's)*	199.
2369	80287-10 *(for PS/2 Models 50 & 60)*	229.
4750	80387SX *(for 80386SX CPU's)*	309.
2371	80387 *(for 16 MHz 80386 CPU's)*	349.
2372	80387-20 *(for 20 MHz 80386 CPU's)*	399.
4121	80387-25 *(for 25 MHz 80386 CPU's)*	499.



Epson ... 1 year
LX-810 Printer–A high speed 9 pin printer perfect for the home, or as a second printer for the office. Includes SmartPark paper handling features. 180 cps draft, 30 cps NLQ (12 cpi mode) ..... $199.

Kensington Microware ... 1 year

2581	Masterpiece	94.
2582	Masterpiece Plus	109.
4972	PowerTree 10	19.
4973	PowerTree 20	27.
4974	PowerTree 50	54.
5697	Expert Mouse *(Trackball for PS/2)*	115.

Key tronic ... 3 years

2537	101 Keyboard	99.
4518	101 Plus Keyboard	99.

Kraft ... 5 years

2603	3 button Joystick	25.
4292	3 button Joystick w/game adapter	49.

KYE International ... lifetime

4127	Dyna Mouse GM6+ *(w/Dr. Halo III)*	49.
4675	GM6000 Mouse *(350-1050 dpi)*	59.

Intel ... 5 years
Inboard 386/PC–Gives new life to your aging PC or XT system with its 16Mhz 80386 processor and 1Mb of memory standard. Optional 1, 2, or 4Mb piggyback expansion available ..... $599.

Logitech ... limited lifetime

5464	Series 2 Mouse *(C9 for PS/2's)*	65.
4388	ClearCase Mouse *(serial only)*	69.
5151	HiREZ Mouse *(C9)*	85.
5152	Mouse w/Paint Show *(C9)*	99.
4297	ScanMan *(hand held scanner)*	185.

Magnavox ... 2 years

4758	13″ CGA Monitor *(8CM515)*	269.
4760	13″ Hi-Res Monitor *(9CMO53)*	369.
4761	13″ VGA Monitor *(9CMO62)*	389.
4762	13″ VGA Monitor *(9CMO82)*	449.

Microsoft ... lifetime

2870	Mach 20 *(1 year warranty)*	349.
2897	Mouse with Paintbrush	109.
2896	Mouse with Easy CAD	125.
2898	Mouse with Windows 286 2.1	139.

Mouse Systems ... lifetime

2812	OmniMouse *(serial only; 1 year wrty)*	39.
4306	PC Mouse II w/PC Paint+	89.

NEC ... 2 years

4799	Multisync 2A *(VGA Monitor)*	499.
5085	Multisync 3-D Monitor	699.

Orchid Technologies ... 4 years

3069	Tiny Turbo 286 *(accelerator board)*	219.
4765	Designer 800 VGA *(360 x 480)*	249.
4690	ProDesigner VGA *(800 x 600)*	310.

Pacific Rim ... 1 year

5010	1.2 Meg External *(for PS/2's)*	215.
5011	360k External 5¼″ Drive	179.

PC Power & Cooling Sys. ... 1 yr
REPLACEMENT POWER SUPPLIES

3202	Turbo Cool 150 *(25° - 40° cooler)*	129.
3205	Turbo Cool 250 *(25° - 30° cooler)*	169.
3200	Silencer 150 *(84% noise reduction)*	115.
3201	Silencer 200 *(69% noise reduction)*	129.
4514	Turbo Cool 375	299.

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Practical Peripherals ... 5 years

3101	1200 Baud Internal Modem	$69.
3100	1200 Baud External Modem *(mini)*	77.
4149	P/Link *(extends par. print signal)*	109.
3097	Microbuffer Inline *(par. print buffer/32k)*	135.
3103	2400 Baud Internal Modem	139.
3102	2400 Baud External Modem	179.
5285	2400 Baud External MNP Modem *(Level 5)*	209.
4542	2400 Baud Internal Modem for PS/2	229.

Princeton Graphics ... 1 year

3166	Ultrasync *(800 x 600 max. res.)*	549.

Quadram ... 1 year

5143	JT-FAX 9600	549.

Safe Power Systems ... 2 years

4561	Safe 250W *(standby power bkup)*	249.
4562	Safe 425W *(standby power bkup)*	369.
4563	Safe 500W *(standby power bkup)*	495.

SOTA Technology ... 2 years

5107	Floppy Drive Controller *(S/P)*	99.
5109	SOTA VGA/16 *(with 256k)*	259.
5111	SOTA 286i-12 *(12 MHz accelerator)*	299.
5402	SOTA 386i-16 *(16 MHz accelerator)*	419.

Targus ... lifetime

4899	Nylon Laptop carrying case	55.
4901	Leather Laptop carrying case	139.

TheComplete PC ... 2 years

4889	TheComplete Hand Scanner 400	159.
5598	TheComplete Half Pg. Scanner 400	189.
4885	TheComplete Answering Machine	219.
4887	TheComplete FAX 9600	429.
5140	TheComplete Page Scanner	549.

Toshiba ... 1 year

3684	T1000 Laptop *(80C88, 6.4 lbs.)*	669.
3681	T1000 768k Memory Card	289.
4856	T3100E Laptop *(12 MHz, 20 Meg)*	2749.
4958	T1600 Laptop *(12 MHz, 20 Meg)*	3249.

Video 7 ... 5 years

3776	VEGA Deluxe *(supports 640x480)*	219.
3778	VEGA VGA	259.
4193	FastWrite VGA *(includes 256k)*	319.
4194	VRAM VGA *(includes 256k)*	469.

Kensington ... 1 year
Expert Mouse–Takes mouse technology a step further with its unique ergonomic design. Moving the ball instead of the whole mouse saves valuable desk space. Automatic acceleration gives smooth & effortless cursor control. . $115.

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2485 Bernoulli II Single 20 Meg Internal $767.
5116 Bernoulli II Single 44 Meg Internal 995.
2486 Bernoulli II Dual 20 Meg External 1659.
5117 Bernoulli II Dual 44 Meg External 1969.
4276 20 Meg Cartridge Tripak *(5¼")* . . . 169.
5113 44 Meg Cartridge Tripak *(5¼")* . . . 249.
CONTROLLERS (required)
2499 PC2 Card . . . . . 169.
2500 PC2B Card *(bootable card for PC/XT/AT)* . . . . . 229.
2502 PC4 Card *(for PS/2 Model 50/60/70/80)* . . . . . 299.

Mountain Computer ... 1 year

2917 40 Meg Internal Tape Drive . . . . . 379.
2915 40 Meg External Tape Drive . . . . . 479.
2916 40 Meg External Tape Drive with Power Supply . . . . . 569.
5378 60 Meg External Tape Drive with Power Supply . . . . . 1169.
5616 150 Meg External Tape Drive with Power Supply . . . . . 1495.
5499 80 Meg Internal Tape Drive . . . . . 519.
5503 80 Meg External Tape Drive . . . . . 629.
5190 40 Meg Data Cartridges *(pre-formatted)* . . . . . 35.

Plus Development ... 2 years

3105 Hardcard 20 Meg *(49 ms)* . . . . . 549.
3106 Hardcard 40 Meg *(28 ms)* . . . . . 699.
5164 Impulse 40 Meg Int. Drive *(12 ms)* 659.
5165 Impulse 80 Meg Int. Drive *(12 ms)* 879.
5163 Impulse Controller *(required)* . . . . 229.

Seagate ... 1 year

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2285 20 Meg Internal Hard Drive ST225 *(w/controller and cables, 65 ms)* . . 289.
2286 30 Meg Internal Hard Drive ST238 *(w/controller and cables, 65 ms)* . . 299.
4554 40 Meg Int. HD ST251-1 (28 ms) . $359.
4624 80 Meg Int. HD ST4096 (28 ms) . . 619.

TEAC ... 1 year

4950 PC, XT 360k Drive *(5¼")* . . . . . 79.
4951 720k Drive *(specify XT or AT, 3½")* . 79.
4670 1.44 Meg Drive for XT *(3½")* . . . . . 99.
4326 1.44 Meg Drive for AT *(includes Bastech software utilities, 3½" copy prot.)* . 119.

Toshiba ... 1 year

3650 AT 360k Drive *(5¼")* . . . . . 85.
3649 AT 1.2 Meg Drive *(5¼")* . . . . . 99.
4755 AT 1.44 Meg Drive *(3½", includes Bastech software utilities)* 119.

MISCELLANEOUS

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1676 CompuServe Information Service . . 24.

Cables ... lifetime

1019 Smartmodem-to-AT cable *(9 feet)* . . 15.
1050 Parallel Printer cable *(15 feet)* . . . . . 19.

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Epson ... 1 year

LQ-2550 Printer—A full-featured 24 pin, 136 column printer. Includes 7 built-in fonts, push tractor, and advanced paper handling. 333 cps draft, 111 cps LQ (12 cpi mode). **call**

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All disks have a lifetime warranty.

5¼" DS/DD Disks *(360k)*

3291 Sony *(10 disks per box)* . . . . . 12.
2789 Maxell MD2-D *(10 disks per box)* . . . 13.
4192 Verbatim Datalife *(10 disks per box)* . 13.

5¼" DS/High Density Disks *(1.2 Meg)*

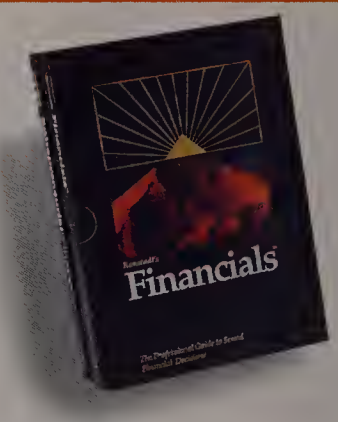
3770 Verbatim Datalife *(10 disks per box)* . 19.
3292 Sony *(10 disks per box)* . . . . . 19.
2790 Maxell MD2-HD *(10 disks per box)* . 19.

3½" DS/DD Diskettes *(720k)*

3297 Sony *(10 disks per box)* . . . . . 15.
3772 Verbatim *(10 disks per box)* . . . . . 15.
2792 Maxell *(10 disks per box)* . . . . . 16.

3½" DS/High-Density Diskettes *(1.44 Meg)*

3298 Sony *(10 disks per box)* . . . . . 32.
3773 Verbatim *(10 disks per box)* . . . . . 32.
2793 Maxell *(10 disks per box)* . . . . . 32.



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MEMORY

3248 256k DRAMs *(120 nanosecond)* . . . call
3241 256k x 9 SIMMs *(100 nanosecond)* call
4366 1 Meg x 9 SIMMs *(100 nanosecond)* call
5510 1 Meg x 9 SIMMs *(80 nanosecond)* call
4705 1 Meg Chips *(100 nanosecond)* . . . call

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- APO/FPO orders shipped 1st Class Mail.
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- Call 603/446-3383 for information.

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Manager's Special: Eight Executive Word Processors

To turn out everyday documents in a hurry, you don't need a heavyweight word processor.

Some no-frills alternatives prove that easy doesn't have to mean simple.

George Campbell

The corporate world is slimming down. Gone are the days when being an executive meant you had a secretary or word processing pool at your beck and call. Even if you're privy to such luxury, you may find it faster (and more private) to handle some of your own word processing. Or you may want to enter rough drafts before passing them on to others for formatting and printing.

For most managers, a *Word* or *WordPerfect* is too much—too hard to learn, too costly, too many gewgaws. Executive word processors offer a lighter-weight alternative that's easier to use. Not limited to the corporate suite, they're often perfect for someone who needs to create memos, letters, short reports, and other simple documents.

The eight packages reviewed here fall into three broad categories. At the high end, Timeworks' *Beyond Word Writer 1.0*, Software Publishing's *Professional Write 2.1*, Symantec's *Q&A Write 1.01*, and Volkswriter Inc.'s *Volkswriter 4 With Correct Grammar* offer editing tools that almost match those of more advanced word processors. But most of these programs lack formatting extras such as style sheets and automatic hyphenation.

At the low end are DacEasy's *DacEasy Word 3.0* and Simon & Schuster's *Webster's NewWorld Writer II*. Their formatting options are stripped to the bone, but they offer solid editing tools.

Samna's *Windows*-based *Ami 1.0a* and Digital Research's *GEM*-based *GEM 1st Word Plus 2.0* stand apart as graphics-oriented editors that depend on a mouse. Only these programs display bold, underlined, and italic text accurately; the others rely on color or shading. Although lacking in compositional tools, *Ami* delivers style sheets and other formatting and desktop publishing extras. *1st Word Plus*, on the other hand, is a low-end editor with average formatting skills.

A Quick Study

Managers' needs vary, but all feel the time pinch. To bring users up to speed quickly, an executive word processor should have an easy-to-grasp, menu-driven interface and hot-key shortcuts and macros to save time once users learn the program. Context-sensitive help and cogent documentation are a must. Many managers will prepare drafts for a secretary to format with a more advanced word processor, so the ability to output files in a variety of formats is a plus.

All the programs offer such editing essentials as block moves, search and replace, and user-expandable spelling checkers; some pro-

vide outliners, thesauruses, and style checkers. Only *Beyond Word Writer* can generate indexes and tables of contents.

Mail merge is less important to most managers, but it's convenient to have. All the programs except *Ami* provide it, but most lack the sophisticated conditional features found in more advanced word processors. The most successful mail merge utilities here are the easy ones. Most require you to create a special document that contains data separated by commas or other delimeters, but *DacEasy* and *Q&A Write* provide built-in flat-file data managers that prompt users for entries.

Most of these word processors skimp on formatting tools and advanced print support, and some even limit the number of formats you can use in a line or document. Only *Ami* competes with the heavyweights in this category, but formatting skills vary among the rest of the programs.

For most managers, though, editing tasks dominate the time spent with a word processor. If this holds true for you, most of these programs should do the job.

Beyond Word Writer 1.0

Timeworks' $199.95 *Beyond Word Writer* boasts an editing tool kit that approaches the range and sophistication of more advanced word processors, and its formatting skills are respectable. Not only that, it's the fastest program in the roundup and one of the easiest to learn and use. Toss in background printing and the ability to import and export 12 word processing formats, and you've got a clear-cut Best Buy.

Beyond Word Writer's well-organized interface relies on pulldown menus augmented with hot keys and mouse support. Contextual help and an indexed manual further smooth the way.

Like Borland's *Sprint*, *Beyond Word Writer* can emulate the interfaces of programs

such as *Word*, *WordPerfect*, and even *1-2-3*; you can also create custom interfaces. But don't expect a perfect match—the menu structures reflect only those features common to both programs.

EXECUTIVE SUMMARY

Beyond Word Writer 1.0

Word processor

The most sophisticoted pockoge in the roundup, *Beyond Word Writer* is also one of the easiest to learn ond use. Top speed odds to its oppeol.

	POOR	FAIR	GOOD	EXCELLENT
Editing				●
Formatting			●	
Printing			●	
Performance				●
Overall value				●

Reader service no. 631

SCOTT BALDWIN

FEATURES EVALUATION

Executive Word Processors: Easy, but Not Simple

Features aren't everything in this genre, but if the program is easy, why not go for the gusto? Beyond Word Writer takes first prize in editing tools, while Ami's the answer for good looks.

● Yes
○ No
◒ Deficient

	Ami	Beyond Word Writer	Dac Easy Word	GEM 1st Word Plus	Professional Write	Q&A Write	Volkswriter 4	Webster's NewWorld Writer
Editing								
Maximum number of windows	1	3	4	4	1	1	1	1
Number of file import formats	11	12	1	3	9	6	2	1
Number of file export formats	1	12	1	1	14	1	2	1
Undo command	● [1]	●	●	○	●	●	●	●
Jump to page	●	●	●	●	●	●	●	○
Delete by word	○	●	●	●	●	●	●	●
Temporarily exits to DOS	○	●	●	○	○	○	●	○
Create macros	○	●	●	○	●	●	○	◒ [2]
Mouse support	●	●	○	●	○	○	○	○
Spelling checker	●	●	●	●	●	●	●	●
Thesaurus	○	●	○	○	●	● [3]	● [3]	●
Outliner	○	●	○	○	○	○	○	●
Style checker	○	◒ [4]	◒ [4]	○	○	○	●	○
Document management system	○	○	○	○	●	○	○	○
Creates index	○	●	○	○	○	○	○	○
Creates table of contents	○	●	○	○	○	○	○	○
Math functions	○	●	○	○	●	●	●	○
Line/box drawing	●	●	○	○	●	●	○	●
Formatting								
Automatic reformat	●	●	●	○	●	●	●	●
Style sheets	●	○	◒ [5]	◒ [5]	○	○	◒ [5]	◒ [5]
Mail merge	○	●	●	●	●	●	●	●
Widow/orphan control	●	●	○	○	○	○	○	●
Automatic hyphenation	●	○	●	●	○	○	●	○
Footnotes	○	●	○	●	○	○	○	○
Headers and footers	●	●	●	●	●	●	●	●
Imports graphics	●	○	○	●	●	●	○	○
Page preview	●	○	○	○	●	○	○	○
Sets italics	●	●	●	●	●	●	●	○
Sets superscript/subscript	●	●	●	●	●	●	●	○
Number of snaking columns per page	8	10	1	1	1	8	1	1
Printing								
Proportional spacing	●	◒ [6]	◒ [6]	◒ [6]	◒ [6]	◒ [6]	◒ [6]	○
Queues documents	●	○	○	●	○	●	●	○
Prints in background	●	●	●	○	○	○	○	○
Supports PostScript	●	○	○	◒ [7]	●	●	●	○
Supports LaserJet cartridge fonts	●	●	◒ [8]	○	●	●	●	○
Supports LaserJet soft fonts	●	◒ [9]	◒ [9]	○	●	●	◒ [10]	○

[1] The only package to provide multiple levels of undo.
[2] One temporary macro per session.
[3] Extra-cost option.
[4] No style analysis; limited to punctuation and grammatical flaws.
[5] Save simple page layouts only.
[6] Printer dependent.
[7] No PostScript font support.
[8] Must insert control codes in font-selection table.
[9] Must download fonts externally and insert control codes in font-selection table.
[10] Supports Hewlett-Packard soft fonts only, and you must download fonts externally.

Editing with *Beyond Word Writer* is fleet and flexible. Hot keys let you delete by word, line, or sentence, and you can insert boilerplate text. You can also open as many as three document windows.

On-screen formatting isn't exactly WYSIWYG, however. Edited text won't reformat until you move the cursor off the line, and most fonts aren't displayed; you must check a menu for current font selections.

Beyond Word Writer offers a wealth of top writing aids. The fast spelling checker has a check-as-you-go option, and the multilevel thesaurus is superb. Other novelties include a fairly accurate punctuation checker, a math function, an outliner, and index and table-of-contents generators. However, mail merge is tedious; you must code a separate data document with delimiters.

Formatting options are thorough and include footnotes, widow and orphan control, and on-screen editing of up to ten snaking columns. You can output files to a wide array of printers, but there's no PostScript support.

Beyond Word Writer deftly balances advanced features and easy operation. Most managers will find it their best bet.

EXECUTIVE SUMMARY

Ami 1.0a

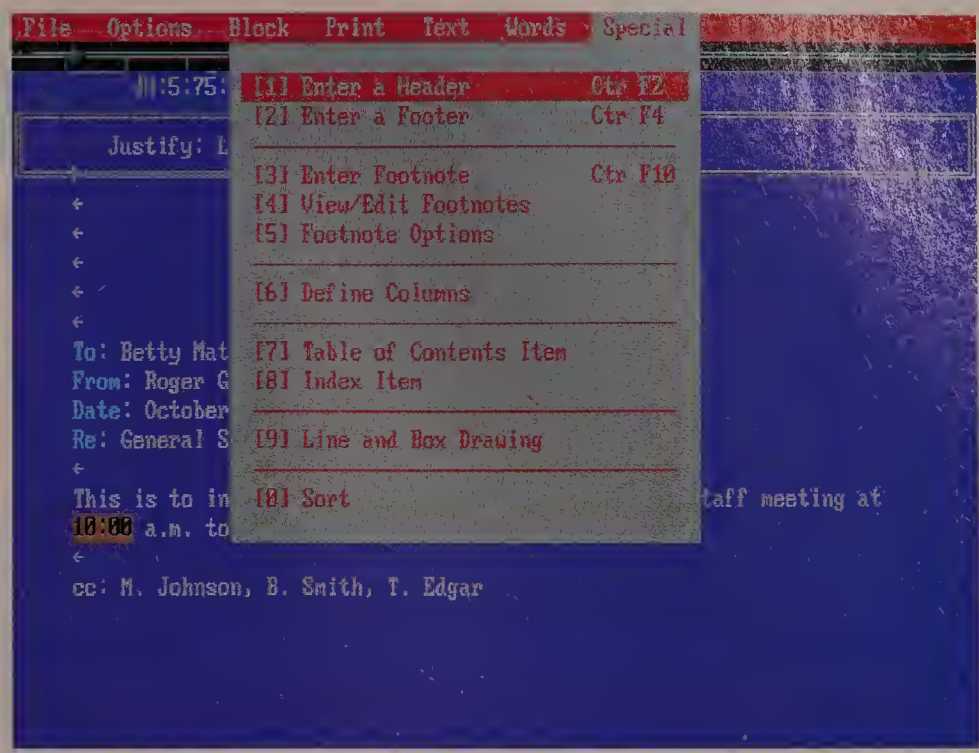
Word processor

BEST BUY

With its desktop publishing features and realistic page display, *Windows*-based *Ami* stands out. Editing tools are basic, but formatting and printer support are superlative.

	POOR	FAIR	GOOD	EXCELLENT
Editing		●		
Formatting				●
Printing				●
Performance			●	
Overall value				●

Reader service no. 630



Beyond Word Writer's pull-down menus and hot keys make the program easy to learn—and you don't lose out on features along the way. This menu shows some of the program's advanced features.

Ami 1.0a

With its graphic interface, desktop publishing touches, and unequaled printer support, Samna's *Windows*-based *Ami* is a standout. The $199 price includes a run-time version of *Windows/286*. Despite its lack of advanced editing features, *Ami* is a Best Buy for those who need highly polished output (see the review of Ami 1.0 in the *Windows* Special Report, *PCW*, May 1989).

Though true to *Windows* conventions, *Ami* looks more like a scaled-down *Ventura Publisher*, sporting *Ventura*-like frames, scroll bars, and style sheets. A mouse is highly recommended, but you can use hot keys to bypass most pulldown menus. Contextual help and a straight-to-the-point manual make learning easy.

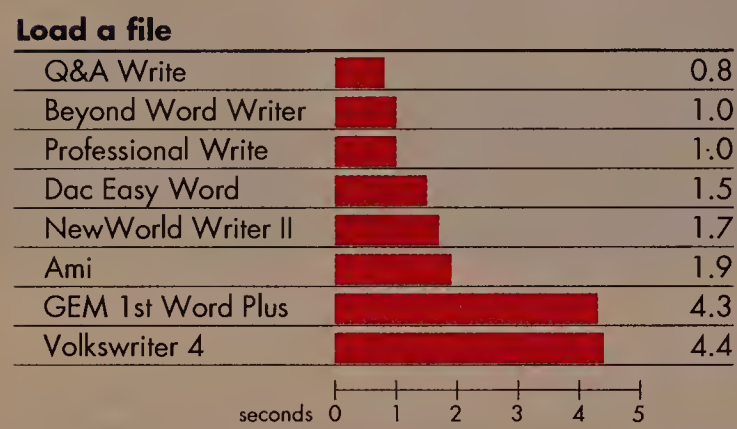
Ami requires at least a fast 286 PC, and for good reason. Although most tasks ran quickly in NSTL tests, screen refresh can be slow. Fortunately, you can switch from the graphics display to a zippier text mode. Editing is fairly easy as long as you're a skilled mouseketeer. Since the program lacks a hot key for deleting a word at the time, you must highlight the text by dragging the mouse, then press <Delete>.

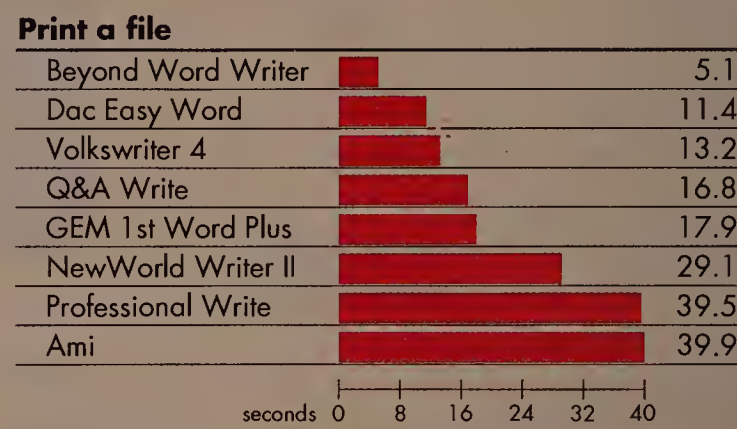
Ami is chintzy on word processing extras. It lacks mail merge, a thesaurus, and macros. However, the spelling checker is excellent, and the undo command can reverse multiple actions.

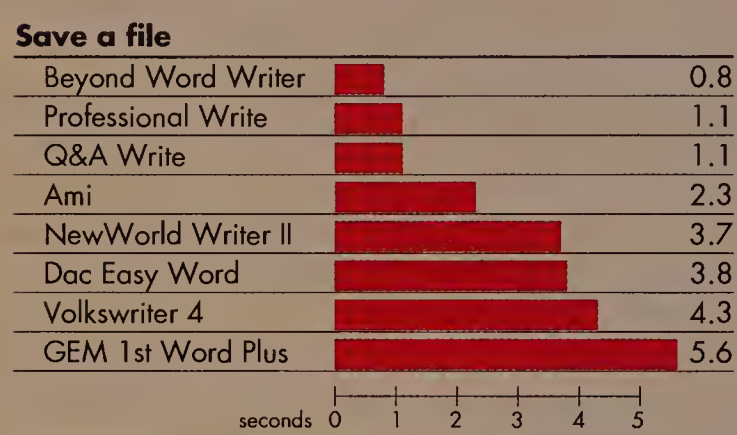
NSTL TEST REPORT

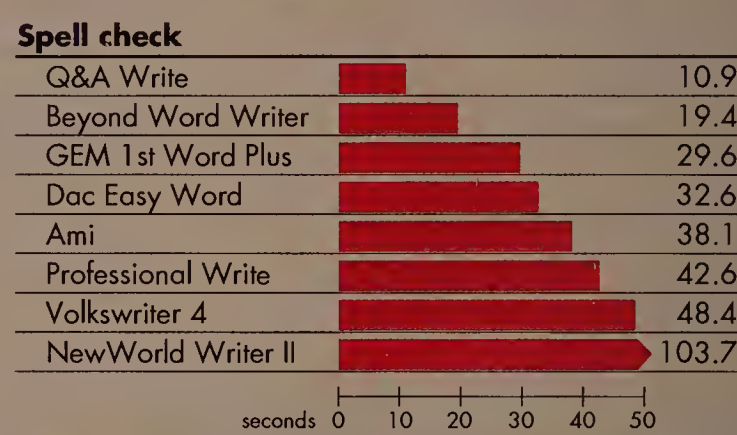
Some Easy Word Processors Are Fast, Too

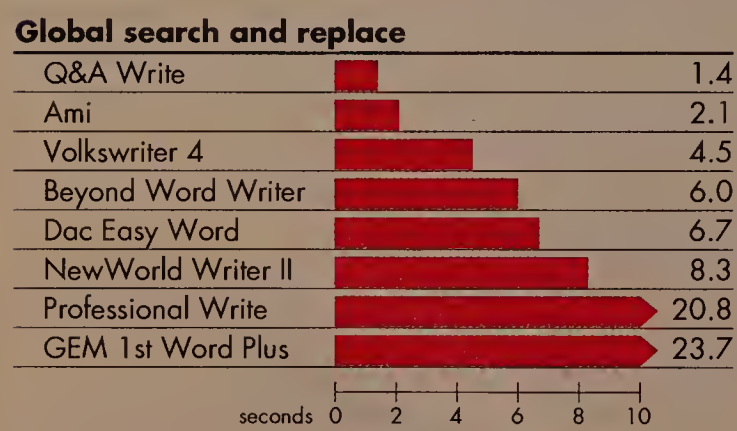
Harried managers need to get the job done fast. Beyond Word Writer is the speed champ, and Q&A Write is also consistently fast. But some programs fall far behind.

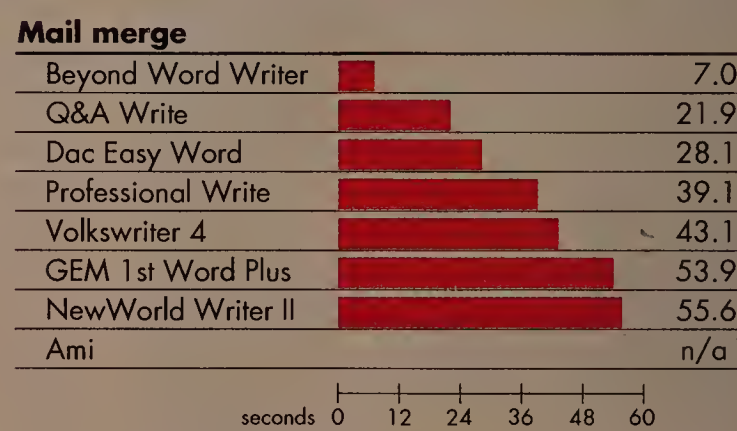












[1] Ami lacks a mail merge facility.

Methodology
Tests were conducted on a 12-MHz Compaq Deskpro 286 with 1MB RAM, DOS 3.3, and a 20MB hard disk. All tests were timed from the command to initiate the test function until control was returned to the user.

Load a file
This test measured the time required to load an 11-page document into the text editor.

Save a file
This test measured the time required to save an 11-page document and clear the screen.

Global search and replace
With the cursor positioned at the beginning of an 11-page document, the program was instructed to automatically replace all 28 instances of *program name* with *program name v. 5.0* and to reformat and repaginate the document as necessary.

Print a file
An 11-page document was "printed" to a device that simulates an infinitely fast printer, one not slowed by paper or printhead movement.

Spell check
This benchmark measured the time a program's spelling checker required to proof an 11-page document. Before the test was timed, words that the program didn't recognize were added to the user dictionary to ensure that the program checked the entire document without interruption.

Mail merge
This benchmark measured the time required to merge a set of 20 address records in ASCII format with a one-page form letter containing 10 different merge fields, plus the time to print the letters to a device that simulates an infinitely fast printer using a Hewlett-Packard LaserJet Series II printer driver. The time required to convert an ASCII file to a proprietary format was added to the print time.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

Page formatting is *Ami*'s forte. You can choose from 24 style sheets ranging from newsletters to memos, or create your own. Unlike its competitors' style sheets, which save only simple layouts, *Ami*'s store paragraph formatting, leading, font settings, and boilerplate. To format paragraphs, you simply tag them with the mouse and select a style from an on-screen menu. When you change settings in a dialog box, *Ami* displays an example in a window.

Like *Beyond Word Writer*, *Ami* can display multiple columns, but it goes a step further with its realistic page display and page preview. You can import and resize TIFF and .PCX graphics and automatically flow text around them. *Ami* imports 11 file formats but can export only ASCII text.

Thanks to *Windows*, *Ami*'s printer and font support are the best in the roundup. You get high-resolution screen fonts, and you can print files in the background.

If you want an easy editor with a nice dose of desktop publishing, *Ami* is your Best Buy.

Professional Write 2.1

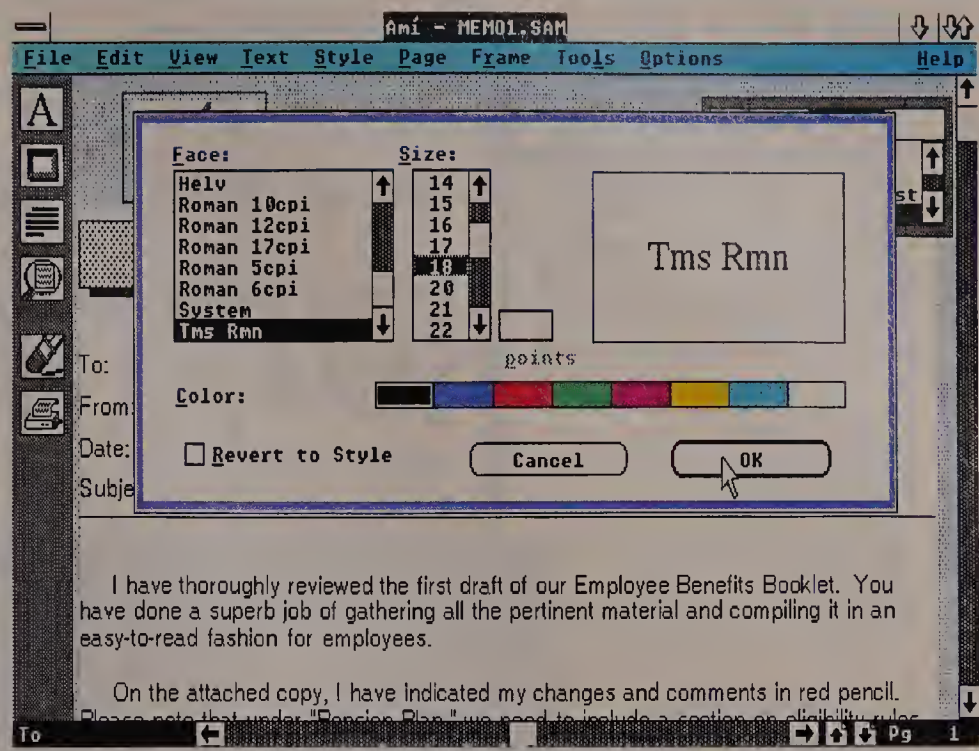
Professional Write helped define the executive word processing genre, and this latest version should extend its success. A mature product, it comes close to matching *Beyond Word Writer*'s feature set while justifying Software Publishing's reputation for ease of use. The $229 package delivers top features, including a document manager and page preview. It just misses earning a Best Buy rating, however, because of its mediocre speed and lack of windows.

Professional Write's superb interface is based on a list of function keys that summon pulldown menus. Contextual, indexed help and a tutorial-style manual bring you up to speed quickly, while hot keys and macros keep you humming along. *Professional Write*'s list of file conversions is generous, offering 9 import and 14 export formats.

Editing and block operations are straightforward, and you can mark tab columns for block moves or math calculations. The spelling checker is accurate, and words you add to the dictionary appear as choices in later checks. The thesaurus won't look up synonyms of a synonym, though.

Formatting is also flexible. Unlike some of its rivals, *Professional Write* sets no limits to the number of formats you can use in a line. After marking a block for formatting, you select margins, fonts (including downloadable laser fonts), and other options from menus. The program supports a wide range of printers, including PostScript.

Like *Ami*, *Professional Write* provides a flexible page-preview mode, complete with a facing page view. Unfortunately, you can't create snaking columns, and although you



Ami's Windows-based interface is ideal for page layout. Font selections, like other options, appear in dialog boxes. A window at the right of the dialog box displays an example of the current setting.

EXECUTIVE SUMMARY

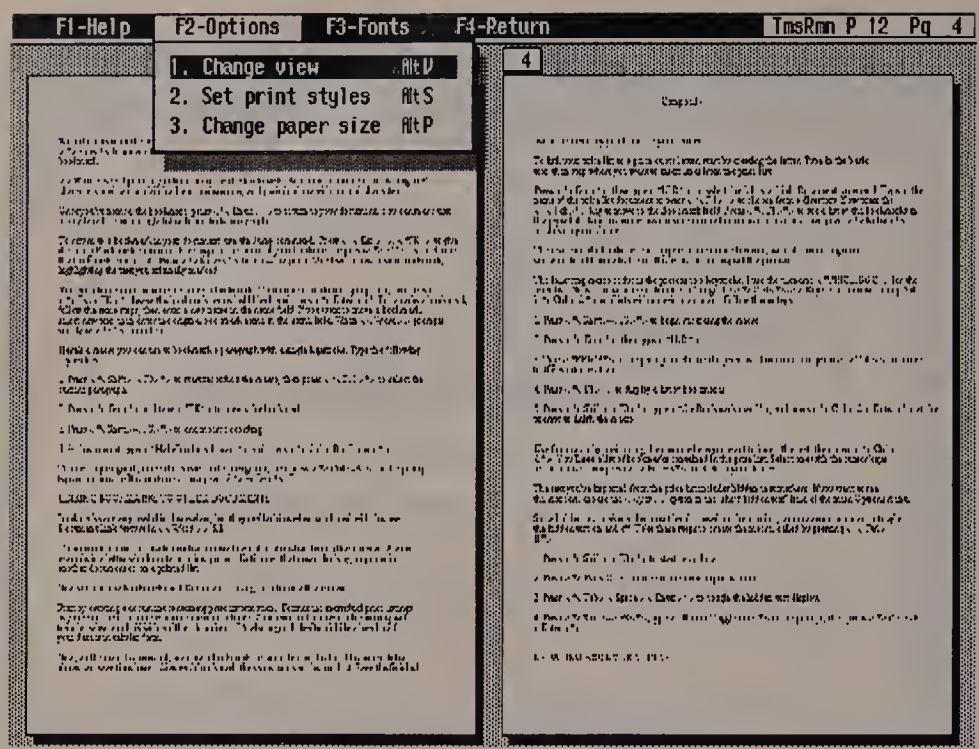
Professional Write 2.1

Word processor

Capable editing tools, plus a page preview mode, make *Professional Write* highly competitive. But slow printing and lack of multiple columns and windows keep it a half-step behind *Beyond Word Writer*.

	POOR	FAIR	GOOD	EXCELLENT
Editing			●	
Formatting			●	
Printing			●	
Performance		●		
Overall value			●	

Reader service no. 634



Professional Write's new page-preview mode offers plenty of options, including a facing page display. You can't display graphics, however.

can import *Harvard Graphics* and *First Graphics* images, you can't size, edit, or display them.

The program's capable document manager performs full-text searches of multiple documents and allows you to encrypt files with passwords and attach comments to them. The mail merge function is better than most, featuring conditional operations and a built-in 2000-record data base module that lets you import addresses into letters. (Field names, however, must be entered manually.)

Professional Write's document manager, page preview, and file conversions place it near the top of the list. *Beyond Word Writer* surpasses it, though, with its top speed and other extras.

DacEasy Word 3.0

The best of the stripped-down "easy" word processors, *DacEasy Word* is fast and a cinch to learn and use. At $69.95, it's also the bargain of the roundup. Despite its lack of import/export routines and minimal print support, *DacEasy Word* is a good choice for simple editing, and it offers the best mail merge of the bunch.

You can master the program's pulldown menu interface in no time, especially given the top-notch manual and contextual help. With its many hot keys, *DacEasy Word* makes editing a breeze, letting you split the screen into as many as four windows. A block operations menu displays automatically whenever you mark a block of text.

Formatting options, though limited, are well implemented. You can add multiple margin and tab settings and call on automatic hyphenation. Print support is inferior, however; you can use only one font per document, and PostScript is not supported.

DacEasy Word's mail merge is tops. Its flat-file data base pops up a field selection window, letting you easily insert field names into merge letters. However, the spelling checker stumbles on transposed letters, and file import/export is limited to ASCII.

DacEasy Word is a good deal for budget buyers who treasure simplicity. But don't expect any formatting marvels.

EXECUTIVE SUMMARY

DacEasy Word 3.0
Word processor

The best of the low-end contenders, *DacEasy Word* will find many friends, due to its low price, intuitive operation, and top-notch mail merge. But it's no formatting wizard.

	POOR	FAIR	GOOD	EXCELLENT
Editing			●	
Formatting		●		
Printing	●			
Performance			●	
Overall value			●	

Reader service no. 632

Q&A Write 1.01

A superset of the word processor built into Symantec's *Q&A* data manager, the $199 *Q&A Write* excels at printer support, search and replace, and mail merge. That, plus fast performance, makes it a good deal, but its demanding interface bars it from the top.

Like *Professional Write*, *Q&A Write* uses function keys that trigger pop-up menus. But the program's lack of mnemonic hot keys makes it tough to learn. You must exit documents for some functions, and manipulating blocks is somewhat cumbersome—you must select commands *before* you mark the text.

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Circle 148 on reader service card

EXECUTIVE SUMMARY

Q&A Write 1.01

Word processor

Q&A Write's interface is tough to master, but fast performance, combined with good mail merge and formatting features, makes it a solid choice.

	POOR	FAIR	GOOD	EXCELLENT
Editing			●	
Formatting			●	
Printing			●	
Performance				●
Overall value			●	

Reader service no. 635

What the editor lacks in flexibility it makes up for in features. *Q&A Write*'s search and replace is the fastest and most sophisticated in the roundup, offering numerous wild-card options. And its spelling checker seldom misses.

The program's formatting options are also relatively complete, if hard to use. Although you can use as many as nine fonts per file, you must select them by number instead of name. On-screen line breaks don't reflect font changes, and although you can print eight snaking columns per page, you can't see them together on screen.

Q&A Write's printer support is better than most, giving you access to both PostScript and LaserJet cartridge and soft fonts. You can also import Lotus .PIC and BASIC BLOAD graphics files, but you can't size, rotate, or display images. Six file imports are available, but export is limited to ASCII.

A flexible built-in data base, second only to *DacEasy Word*'s, lets you insert mail merge field names quickly. It provides the best conditional searches of the roundup, and its unique envelope print module automatically reads addresses from letters.

Q&A Write's top speed, mail merge, and print support make it a sound value; unfortunately, its complex interface will discourage many users.

Volkswriter 4 With Correct Grammar

Lifetree's venerable *Volkswriter 4* is the only program reviewed that provides a style and grammar checker. The $199 program also features fairly advanced editing and formatting, but a quirky interface limits its appeal.

Driven by function keys, the interface lets you choose from menus, but it's hard to remember which key to press—there are no mnemonic hot keys or macros, and on-line "help" is a cluttered list of key assignments.

Basic editing tasks are straightforward—to delete a word, for example, you simply press <F4>—but screen display is flawed. When you're marking a block, the whole screen reverses color, and edited paragraphs don't reformat until you move the cursor.

The formatting options are fairly comprehensive but hard to use. For example, headers, footers, and page numbers require arcane dot commands.

Volkswriter 4's grammar checker is tops at spotting punctuation errors, but the style checker often flags correct usage as suspect. Mail merge operations require comma-delimited data and do not allow conditional operators. Import/export options are limited to DCA and ASCII.

Despite its grammar checker, *Volkswriter 4* is only a fair value. Few will put up with its stony interface.

EXECUTIVE SUMMARY

Volkswriter 4 With Correct Grammar

Word processor

Volkswriter 4's style and grammar checker can't compensate for other shortcomings. A thorny interface locking macros, hot keys, and on-line help slows the user down.

	POOR	FAIR	GOOD	EXCELLENT
Editing			●	
Formatting			●	
Printing				●
Performance				●
Overall value			●	

Reader service no. 636

Q&A Write's search and replace is the fastest and most sophisticated in the roundup.

Beyond Word Writer wins a Best Buy by combining powerful features with editing convenience.

EXECUTIVE SUMMARY

Webster's NewWorld Writer II

Word processor

Poor printer support, slow operation, and limited features dampen the appeal of *Webster's NewWorld Writer*, but a friendly interface and superb thesaurus and outliner may recommend it for bare-bones composition.

	POOR	FAIR	GOOD	EXCELLENT
Editing			●	
Formatting			●	
Printing		●		
Performance		●		
Overall value			●	

Reader service no. 637

Webster's NewWorld Writer II

Designed for simple writing tasks, *Webster's NewWorld Writer II* can't match *DacEasy Word*. Despite an easily grasped interface and top-notch outliner and thesaurus, the $109.95 program is crippled by its weak printer support and slow printing, spell checking, and mail merge.

You control the flexible command-line menu with cursor keys or by typing the appropriate letter. <Alt>-*key* commands bypass most menus, but only one temporary macro can be created. A unique help option displays contextual help automatically.

Editing operations are easy enough, but insertions push existing text off the screen until you move the cursor. File import/export is limited to ASCII.

Formatting options are scant, there's no automatic hyphenation, and font support is poor. Unless you want to embed control codes, you're stuck with each printer's default settings for normal, bold, and underlined fonts. Mail merge requires an encoded ASCII data file.

On the plus side, *NewWorld Writer II* offers a full complement of writing aids. The 330,000-word thesaurus is the best in the roundup, displaying the root word and synonyms in helpful dictionary-style groups and letting you look up synonyms for a synonym. The memory-resident outliner is outstanding, including a phone book and other desktop utilities. However, the spelling checker is slow and keystroke happy.

If you're looking for top writing aids in an easy-to-use package, *Webster's NewWorld Writer II* may be the ticket. But its crude formatting options disqualify it for most users.

GEM 1st Word Plus 2.0

Like *Ami*, the $99 *GEM 1st Word Plus* from Digital Research is wrapped in a graphic interface. It lacks *Ami*'s formatting prowess, however, offers scanty font and printer support, and requires you to exit the program for some tasks.

1st Word Plus includes *GEM/3 Desktop*, the competent *GEM Paint*, and a separate mail merge program, *GEM 1st Mail*. Non-*GEM* users will get bogged down learning this cryptic environment, though; the interface shifts too often between mouse and keyboard. Predefined hot keys are available, but you can't define your own, and contextual help is meager.

The program's rather basic editing tools are made awkward by the lack of automatic reformatting. The spelling checker can check as you type, but it often guesses wrong.

EXECUTIVE SUMMARY

GEM 1st Word Plus 2.0

Word processor

Dedicated *GEM Desktop* users may want to take a look at this graphics-based program; others will find its limited features and clumsy interface too much of a drawback.

	POOR	FAIR	GOOD	EXCELLENT
Editing		●		
Formatting			●	
Printing		●		
Performance			●	
Overall value		●		

Reader service no. 633

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- **Recommendations** are inserted directly into your text to point out problem areas.
- **Graphical Indexes** measure the strength, readability, and other overall qualities of your writing.
- **A New Menu System** allows you to change RightWriter to meet your particular needs.
- **Includes RightWords—FREE!** *(A $30 Value!)* Quickly customize RightWriter's vocabulary to fit your needs.
- **For use with IBM PC, XT, AT, PS/2 and compatibles.**

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"...a must buy for the businessman who writes memos all day. Highly recommended."
—John Dvorak

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—Computer Buyers Guide

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—The New York Times

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Fax: (813) 921-7849
Telex: 91-035098

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Despite the graphic interface, *1st Word Plus* offers no page preview and is surprisingly weak on formatting. Basic layouts are easy: You simply highlight text with the mouse and select a menu option. It's not possible to mix text styles on a line, though, or do multicolumn formatting. *1st Word Plus* can hyphenate and create footnotes, but it lacks *Ami*'s true style sheets and paragraph-tagging approach to formatting.

You can import graphics only from *GEM Paint*, you can't wrap text around them as in *Ami*, and they can be sized only in *GEM Paint*. Print support is also skimpy: Not only are you limited to a printer's default fonts, but to print a file you must exit and run a separate program, creating a second file in the process. The mail merge is one of the most anemic in the roundup and requires exiting to another utility and using comma-delimited data files.

GEM 1st Word Plus lacks the chops to get the job done. Unless you're a *GEM* aficionado, keep looking.

Never Too Busy for Words

As this roundup's two Best Buys demonstrate, you don't have to cripple a program's features to make it easy to use. *Beyond Word Writer* wins a Best Buy by combining powerful features with editing convenience. *Ami* achieves the same honor by providing superb formatting tools while delivering just enough editing licks. Among the runners-up, *DacEasy Word* is the king of the low-cost, easy editors, while *Professional Write* and *Q&A Write* offer valid alternatives to *Beyond Word Writer.*

Managers don't need simple word processing—they need easy word processing. Luckily a number of programs can deliver this tricky order in fine style. ●

George Campbell operates a busy BBS and specializes in telecommunications and word processing.

For more information about all products in this article, circle reader service number 902.

WHERE TO BUY

Ami 1.0a
Samna Corp.
5600 Glenridge Dr.
#300
Atlanta, GA 30342
800/831-9679,
404/851-0007
LIST PRICE: $199
REQUIREMENTS: 80286 or 80386 system, 640K, hard disk, graphics adapter, DOS 3.0 or later version, Windows 2.03 or later version (Windows run-time version included)
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 8–7
OTHER SUPPORT: newsletter, BBS
Reader service no. 630

Beyond Word Writer 1.0
Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015
312/948-9206
LIST PRICE: $199.95
REQUIREMENTS: 512K, two disk drives, DOS 2.1 or later version
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 9–5
OTHER SUPPORT: none
Reader service no. 631

DacEasy Word 3.0
DacEasy Inc.
17950 Preston Rd. #800
Dallas, TX 75252
800/877-8088,
214/248-0205
LIST PRICE: $69.95
REQUIREMENTS: 384K, two disk drives, DOS 2.0 or later version
TECHNICAL SUPPORT: one 10-minute phone call within 60 days, toll-free number, M–F 9–5
OTHER SUPPORT: none
Reader service no. 632

GEM 1st Word Plus 2.0
Digital Research
70 Garden Ct.
Box DRI
Monterey, CA 93942
800/443-4200
LIST PRICE: $99
REQUIREMENTS: 512K, hard disk, graphics adapter, DOS 2.1 or later version
TECHNICAL SUPPORT: 90 days free, $95 for one-year, no toll-free number, M–F 8:30–5
OTHER SUPPORT: CompuServe forum (GO DRFORUM)
Reader service no. 633

Professional Write 2.1
Software Publishing Corp.
P.O. Box 7210
1901 Landings Dr.
Mountain View, CA 94039-7210
415/962-8910
LIST PRICE: $229, $39 upgrade from version 2.0
REQUIREMENTS: 512K, two disk drives (hard disk recommended), DOS 2.0 or later version
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 8–4
OTHER SUPPORT: newsletter, CompuServe forum (GO SPC)
Reader service no. 634

Q&A Write 1.01
Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
408/253-9600
LIST PRICE: $199, thesaurus $49.95
REQUIREMENTS: 384K, two disk drives, DOS 2.0 or later version
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 6–5
OTHER SUPPORT: quarterly newsletter, BBS
Reader service no. 635

Volkswriter 4 With Correct Grammar
Volkswriter, Inc.
411 Pacific St.
Monterey, CA 93940
408/373-4718
LIST PRICE: $199, $88 upgrade from version 3; thesaurus $39; $10 per disk for additional file conversions (three conversions per disk)
REQUIREMENTS: 640K, hard disk (two floppy drives if you don't run Correct Grammar), DOS 2.0 or later version
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 8–3
OTHER SUPPORT: quarterly newsletter
Reader service no. 636

Webster's NewWorld Writer II
Simon & Schuster
One Gulf+Western Plaza
New York, NY 10023
800/223-2336
LIST PRICE: $109.95
REQUIREMENTS: 512K, two disk drives, DOS 2.1 or later version
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 8:45–5
OTHER SUPPORT: none
Reader service no. 637

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AutoSketch is the simple to use CAD package for anyone who draws. You can quickly create technical illustrations, architectural drawings, assembly drawings, flow charts and schematics, interior designs—even electrical, mechanical and civil engineering drawings.

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Drawings With Up To 10 Layers.

And with AutoSketch, repetitive drawing is eliminated. You can insert previously drawn images Into new drawings and build up a library of your images to use anywhere. Draw in color, and in up to ten layers. If you're designing a house, for example, you can put the floor plan on one layer, electrical circuitry and plumbing on the second, furniture on the third, and landscape design on the fourth.

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A QUICK LOOK

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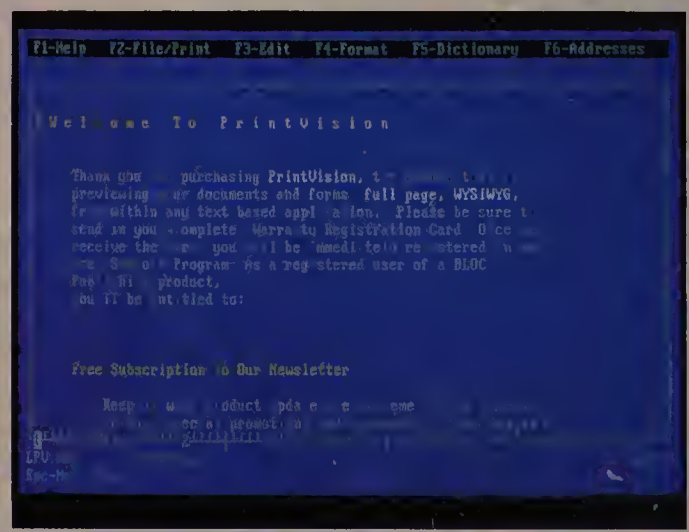

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FormFiller *allows easy, fast fill-in of* ***any*** *form, using virtually* ***any*** *PC and printer—regardless of the form's spacing or complexity—and you don't need a graphics adapter or color monitor.*

FormFiller locates blanks on your form *by printing a 'grid' directly on the form. From this grid, FormFiller automatically creates a 'master template' and sets up fields for each blank on the form—you can simply tab from one blank to the next.*

This is the ONLY system that completely synchronizes your computer and printer *—using this 'template' concept for fast, accurate fill-in of any pre-printed form!*

And FormFiller is the only system that allows fill-in of double-sided, multi-part, or interleaved carbon forms.

FormFiller's precise fill-in capabilities, along with its math, database and importing features makes it the premiere forms processing package available today.

FormFiller 2.0 Named "Best Buy"

PC WORLD magazine named FormFiller 2.0 "Best Buy" in forms processing software for 1989.

FormFiller 2.0 $149

A QUICK LOOK

- ***Easy To Use*** *Version 2's streamlined, "word-processor-like" feel is perfect for both novice* ***and*** *advanced users.*
- ***Fill-In Any Form*** *With FormFiller's unique 'grid' design, you can quickly match the spacing of any form to achieve pinpoint-precision. And FormFiller will support up to 640 fields!*
- ***Powerful Import Capabilities*** *FormFiller will allow you to 'swap' data with your favorite spreadsheet or database, eliminating double entry. You can also import/merge/export any DIF, dBASE II, III, Lotus 1-2-3 (WKS and WK1) or ASCII files.*
- ***Ingenious "Look-up" Feature*** *FormFiller can actually look up details (like part numbers and prices) for you—and fill them automatically into position on the form.*
- ***Powerful Math Functions*** *Built-in spreadsheet functions that automatically fill-in calculated values. It even checks the forms for errors and omissions.*

FAST AND EASY FORM FILL-IN! *By taking the repetitive, tedious work out of form fill-in, FormFiller enhances accuracy and greatly increases speed. Data can be stored within the template—and printed automatically! Call it up, make necessary changes, and print the entire form again.*

PINPOINT-PRECISE SPACING *FormFiller has the flexibility to match* ***any*** *spacing of blanks on your forms—it allows each field to be individually adjusted, if necessary, by increments of 1/700th of an inch—so every "X" will appear* ***in*** *the proper box—not* ***below*** *or* ***beside*** *it.*

SPREADSHEET-LIKE FINANCIAL AND MATH FUNCTIONS
FormFiller's powerful math and financial functions will calculate figures and fill them in for you—automatically!

FormFiller can add the numbers in specified fields, deduct a specified discount, and print the total in a specified field. Fill-in data can be stored for later recall and fill-in. Change one number, and FormFiller will automatically re-calculate the numbers and enter them into proper position on the form.

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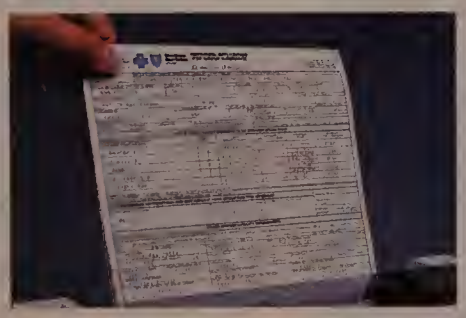

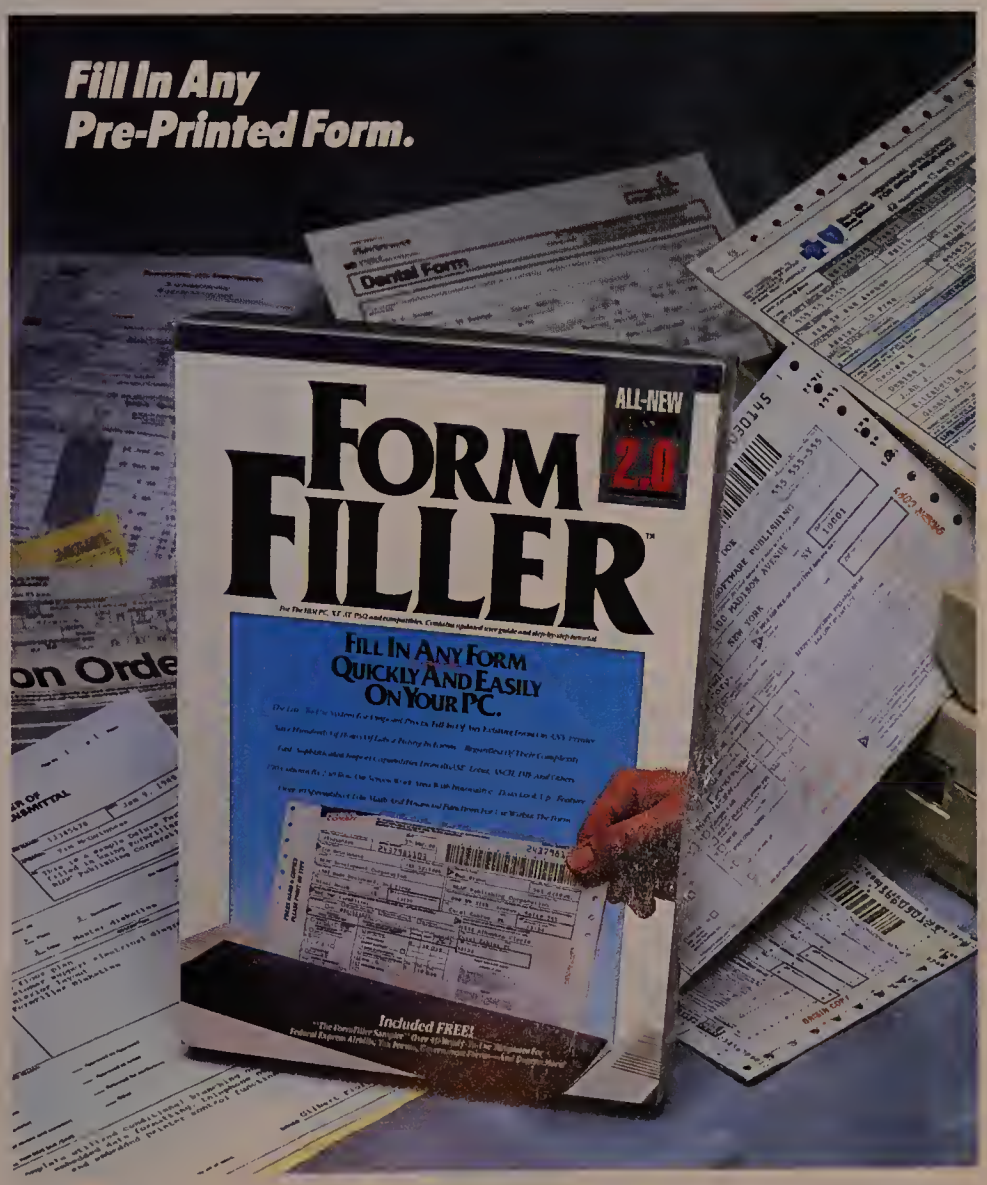

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I was astounded. I reconciled not only my current statement, but the two I've been putting off doing for the previous months—all in about 15 minutes!

Since I started over four months ago, I've completely organized my credit card accounts, set up a budget for my expenses and more importantly, turned all my regular monthly bills over to Quicken.

I now have a great overview of my financial activities—where I'm spending (and overspending), keeping track of my loan balances and my investments—I even calculated my net worth. Pretty good for a guy who used to hate doing anything with his checkbook!

I go shopping and paper checks at the store, and simply enter the amount when I return home—my balance is automatically updated. The fact is, I don't even have a checkbook anymore!

Sounds crazy, but I love to pay my bills!"

—Fred Gibson, Quicken user

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When the taxman comes—be ready! Quicken provides detailed reports on taxable income and available deductions. It also links with popular tax preparation software packages.

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Quickly establish a budget for what you plan to spend in each category—Quicken will provide comparisons as to the actual vs. budgeted expenses, either by month or annually.

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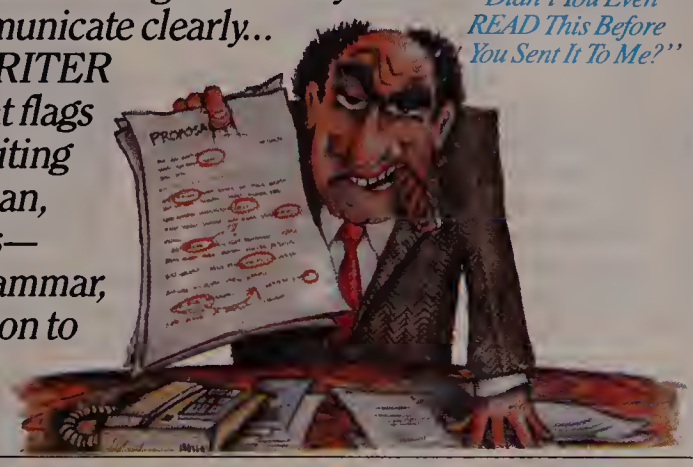

EASY TO USE—JUST A ONE-WORD COMMAND! RightWriter is the most accurate system for business and technical writing. RightWriter analyzes documents produced by leading word processors for errors in grammar, style, usage, and punctuation. Using an arsenal of over 4,500 writing rules, RightWriter uses artificial intelligence to help make your writing clear, concise and powerful.

Just create your document as you normally would, then, with a one-word command, RightWriter will check your document and display errors and comments. RightWriter never changes your writing...it only makes recommendations.

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RightWriter 3.1 $79

A QUICK LOOK

RightWriter helps you produce clean, powerful writing. With just a one-word command, RightWriter scans your document for errors in grammar, style, usage and punctuation.

Specific Recommendations
RightWriter flags common writing errors such as passive voice, noun-verb agreement and more.

Readability And Strength Index
The Readability Index shows the educational level a reader requires to understand your writing. The Strength Index measures your writing's strength.

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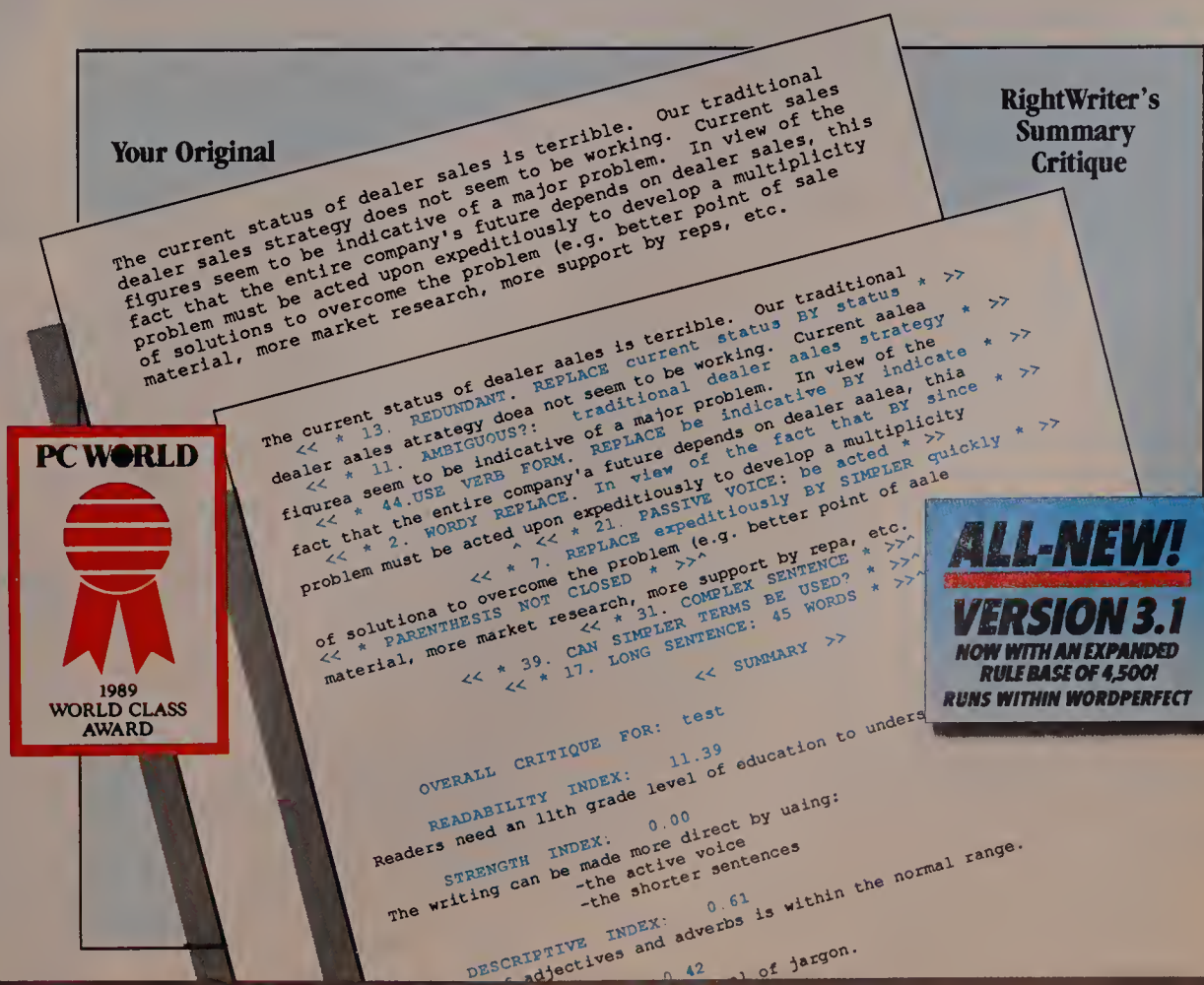

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"...Its simple, clean design makes it quick to learn and use...We were able to draw our purchase order form in just 6 minutes. Lines and boxes are very easy to draw and erase"
—PC MAGAZINE

The perfect tool for fast information gathering! *Throw away those generic form books, expensive typsetting invoices and printing headaches. With FORMTOOL, you can create, edit, manage, and print any form—from postage stamp size up to 13 inches quickly and easily on your PC, XT, AT or PS/2.* ***And it's so easy!*** *You draw lines and boxes by simply moving the cursor!—and FORMTOOL is compatible with virtually all dot matrix, letter quality and laser printers. Produce your own invoices, purchase orders, shipping documents, employee time sheets, evaluation forms, estimate forms—hundreds of uses!*

And FormTool will print forms sideways, adjustment of line and character spacing—even print math symbols.

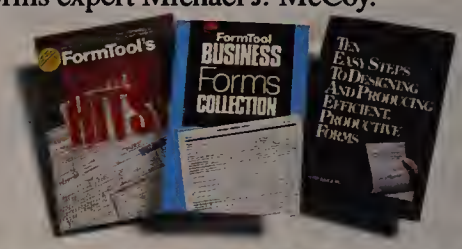
FormTool was designed to meet an urgent need of the business environment: provide a low-cost means by which users can quickly and easily create their own forms using virtually any equipment—Just sit down and create a form.

Draw Lines, Boxes And Grids—In Seconds

FormTool streamlines the PC's ability to draw—lines, boxes and grids are drawn for you with just a couple of keystrokes. You can change your grid layout, adjust type sizes, rearrange boxes—in seconds!

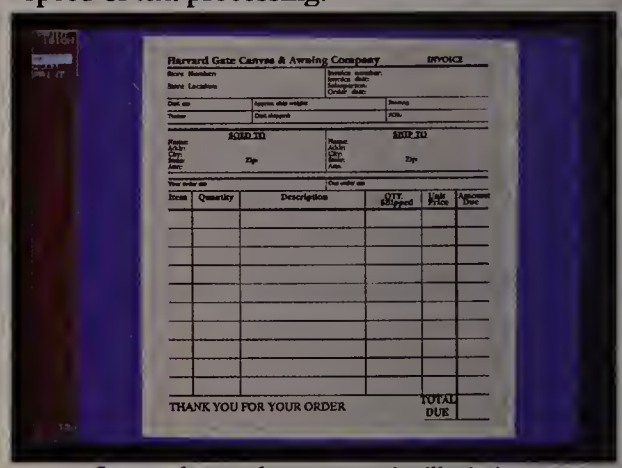
An advanced word processor handles word and character wrapping, custom "FastTabs," and the ability to automatically fit text into a defined area—or quickly reformat if necessary.

"THE FORMTOOL FORMS DESIGN KIT." FormTool includes over 120 pre-designed forms ready to use—or modify them to fit your particular needs. Plus, a guide to forms design by forms expert Michael J. McCoy.



INCLUDES FULL-PAGE WYSIWYG PREVIEW!

Preview your forms—full-page—with our new WYSIWYG preview capability. Spot errors in spacing, layout, type and alignment before commiting the form to paper. This new feature provides the WYSIWYG advantages of graphics-based products with the blistering speed of text processing.



See your form on the screen—as it will print!

ANATOMY OF A FORMTOOL FORM

Horizontal And Vertical Line Drawing
All you have to do is position the cursor where you want to draw a line. Then hit one key, and FormTool will automatically draw the line.

Perfect Corners
FormTool will end every line with perfect corners and T's, every time. It will even pipe double lines.

Line Width
Just specify single, double, or bold lines, and FormTool will draw them. You can also switch between single, double and bold lines with one keystroke.

Automatic Grid Drawing
Drawing a grid is as easy. Just specify:
•Column width •Number of columns
•Row heigth •Number of rows
Or leave any out, and FormTool will automatically draw the grid based on your specifications.

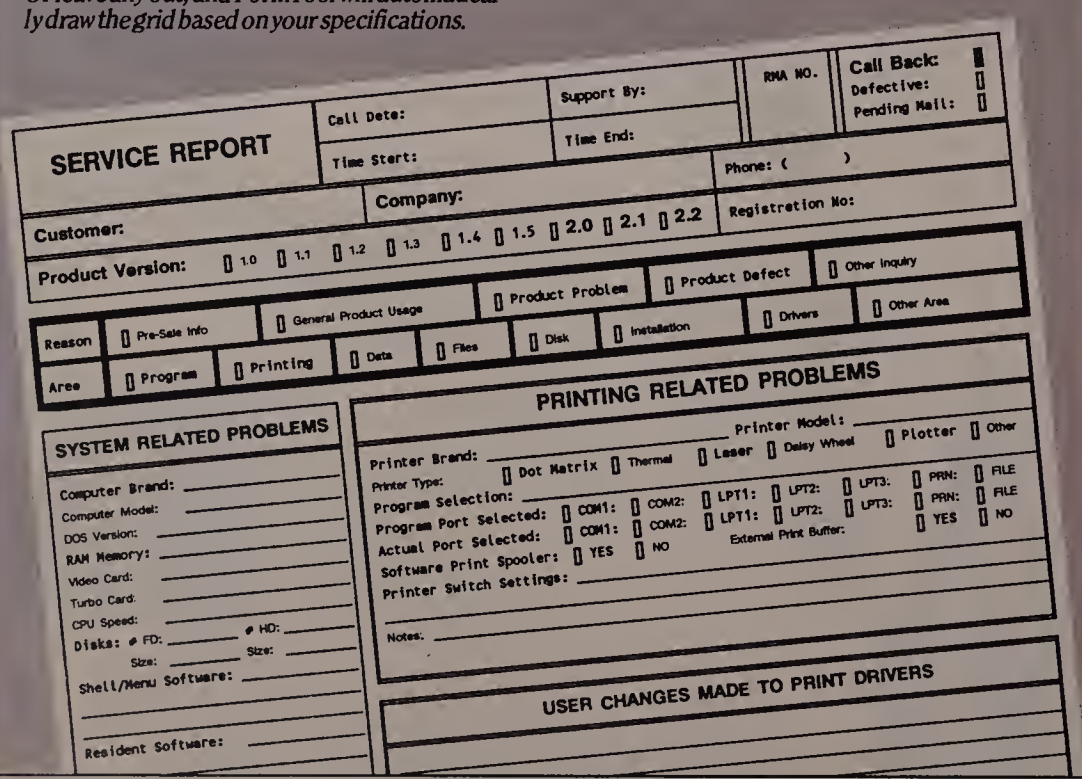
Large Letters
You can select large letters, and even oversize letters up to one inch tall.

Variable Type Sizes
Variable sizes, and styles are available, and are selected from an easy-to-follow menu.

Special Characters
Special characters like this box, as well as math symbols and graphic characters are available.

Mix Single And Double Lines
And they still end in the right place.

Variable Spacing
Specify variable line spacing of 6, 8, or 10 lines per inch and character spacing of 10, 12, 15, or 17 characters per inch, from FormTool's menu.

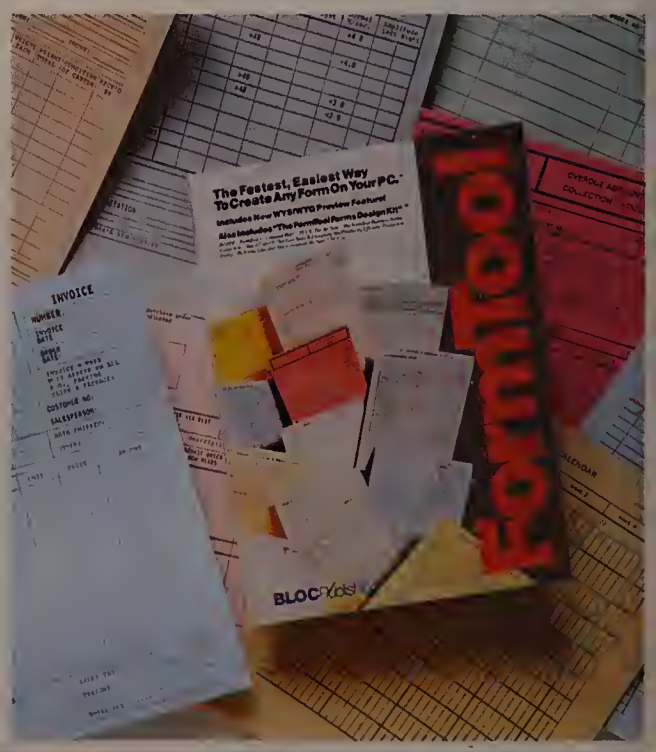


Even the most complex forms can be created in just minutes!

FormTool From Tiger

PW 1010 FormTool 3½" PS/2.....$95.00
PW 1020 FormTool 5¼ PC/Compatible.....$95.00

IBM PC, PS/2, compatible with 256K memory. Floppy or hard disk, supports all color or monochrome monitors with or without graphics card and virtually all dot matrix, daisywheel and laser printers.



TO ORDER, CALL TOLL-FREE: (800) 888-4437

Create Mailing Labels, Envelopes, Post Cards, And Customized Letters—Right Out Of The Box!

The Single Package For Fast, Easy Mail And Customer List Management.

Keep in touch with customers, contacts, prospects and associates. *FastPak Mail is the ready-to-use package that gives users of any expertise level the ability to completely automate their entire mail preparation process. It includes* ***built-in support to automatically print virtually all brands of continuous adhesive labels.***

Prints your customized letters, envelopes, post cards, name tags, shipping labels, clear labels, rotary index cards, continuous envelopes, C.O.D. labels—plus hundreds more!

Use your existing information. *You can quickly insert names, addresses, and customized messages into the body of your letters using FastPak Mail to import information from programs like dBASE for timely, efficient mailings.*

Small or large mailings! *FastPak Mail takes the guesswork out of mailing—even sorts bulk mail for lowest possible postage rates.*

Newsletters, direct mail campaigns, *fund-raising, follow-up, prospecting, questionaires, holidays, special events—any mailing task!*

FastPak Mail $79.95

A QUICK LOOK

FastPak Mail is a complete mail preparation system that combines mail and customer list management into a simple-to-use package.

There are hundreds of built-in label formats, making FastPak Mail ready to go out of the box.

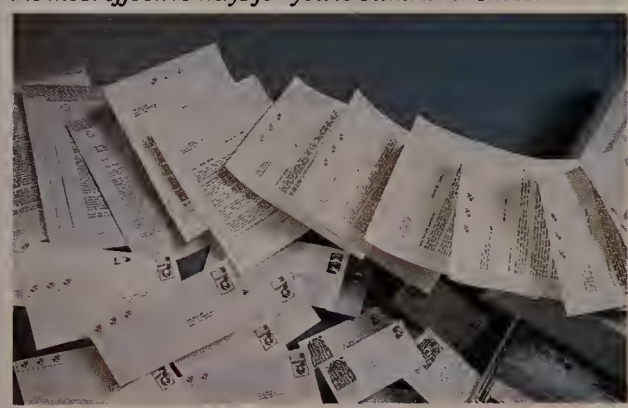
Also includes easy importing, so any existing list can be utilized for professional mail merge.

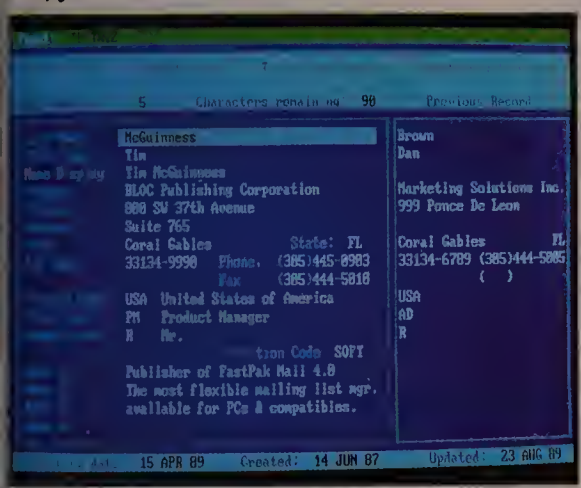
PERFECT FOR PERSONAL OR BUSINESS MAILINGS! FastPak Mail contains hundreds of pre-defined formats for any mailing task—it's so simple to set up and use that you'll be organizing and printing lists minutes after opening the box!

FastPak Mail is so feature-rich (with it's mini database and word processor) and flexible, you'll never run out of uses.

A Great DIRECT MAIL Tool! *FastPak Mail contains features found in large dirct mail systems—in a friendlier, simplified format.*

Staying in front of you list of customers and potential customers with a company newsletter is perhaps one of the most effective ways for you to build awareness.





Two Keystrokes...

Pops-up the FastPak menu to add a name to your list.

Create labels by selecting from hundreds of pre-defined formats.

Give FastPak Mail a zip code, and it will automatically look up the City, State and area code!

Includes fast, easy importing features—you can use any of your existing data in FastPak Mail—eliminating re-entry of data!

READY-TO-PRINT LISTS AND LABELS Print labels 1,2,3 or 4 across, clear labels, rotary index cards, file folder labels, packing labels, name tags, post cards, envelopes, invoices, 3 x 5 index cards, cassette labels—and dozens more!

FAST, EASY BULK MAILING FEATURES Easy to use bulk rate sorting, indexing and labelling—FastPak Mail will automatically eliminate any duplicates in your list and sort your bulk mailings by 9, 5, or 3-digits—for postage savings up to 25%!

MERGE NAMES AND ADDRESSES INTO YOUR LETTERS Convert any list that you have (from dBASE, Lotus, or any ASCII file) and merge that information (names, addresses, etc.) into the body of your letters. Everything you mail will be clean and professional-looking. And FastPak Mail is compatible with virtually any program—eliminating data re-entry!

Use FastPak Mail to customize proposals, reports, letters, notices, statements, invitations, follow-up notes and press releases.

MANAGE YOUR CUSTOMER LIST WITH FASTPAK MAIL!

PW 4550 FastPak Mail IBM PC and compatibles—5¼-inch.....$79.95
PW 4555 FastPak Mail PS/2 and compatibles—3½ inch.....$79.95

IBM PC, XT, AT, PS/2 and compatibles with 256K. Supports hundreds of dot matrix or laser printer.

FOR MORE INFORMATION ABOUT THIS PRODUCT, OR TO ORDER, CALL (800) 888-4437

MONITOR AND MAINTAIN YOUR LAPTOP BATTERIES...

IT'S LIKE HAVING A FUEL GAUGE FOR YOUR LAPTOP'S BATTERY!

This software can stop your laptop from stopping you! *With the increasing popularity of the laptop computer, business people on the go are becoming more productive—but they're at the mercy of their laptop's* ***rechargable NiCad battery.***

BATTERY WATCH is an indispensible laptop accessory that puts your laptop's true battery reserves and maximum possible charging capacity right at your fingertips.

A pop-up window ***displays how much longer your battery will last****—and it's updated every two seconds! BATTERY WATCH also includes a feature that solves NiCad battery memory problems so you'll always enjoy maximum charge. An absolute must for laptop users—requires just 10-20K depending on laptop type.*

WHY YOU NEED BATTERY WATCH... Just install this remarkable software onto your laptop and stop worrying about how much life is left in your NiCad battery. A simple keystroke pops-up BATTERY WATCH and displays how much time ("Estimated time to empty") is left on the charge—with updates every two seconds.

And BATTERY WATCH trains your NiCad battery's memory to hold its original charge-retention capacity—no more battery "quick death," characteristic of laptops. This feature can save you the cost of a replacement battery.

Battery Watch $39.95

A QUICK LOOK

Indispensible software utility for laptop users. Allows current charge status (updated every 2 seconds) of NiCad batteries, and provides easy to use tools that automatically help batteries charge fully—most laptop batteries eventually lose up to 50% of their charge capacity.

Compatible with these laptops...

Amstrad PPC 512 & 640
Compaq SLT/286
Data General 2T
Datavue Spark
Epson Equity LT (LCD) & (HD)
Epson Equity LT (backlit LCD)
IBM Convertible
NEC Multispeed (EL) (HD)
Sharp 4501, 4502, 4521
Tandy 1400
Toshiba T1000/T1100plus/T1200F
T1200F backlit/T1200H backlit
Zenith 181/183/184/Supersport and Zenith Supersport 286

Battery Watch From TigerSoftware

PW 5570 Battery Watch—IBM 3½ inch.....$39.95

PAY YOUR BILLS ELECTRONICALLY—WITHOUT WRITING CHECKS!

STOP WRITING AND MAILING CHECKS. PAY YOUR BILLS ELECTRONICALLY, IN JUST MINUTES PER MONTH!

CheckFree *allows you to pay all of your bills electronically—using your PC and a modem.* ***Avoid the monthly agony of check writing and paperwork!*** *Here's how it works:*

Just enter the merchants who will receive payments from you and "write" checks to them on screen. The CheckFree software then automatically sends the payment information to the CHECKFREE processing center.

CHECKFREE processes your payment through the ***Federal Reserve System's Automated Clearing House****, which is connected with all financial institutions. You do nothing—CHECKFREE handles all payment arragements with merchants and banks. Save time (especially at tax time)—even balancing your checkbook is virtually automatic! Your current balance is tracked with an automated check register that will produce detailed reports for each transaction. CHECKFREE will automatically make fixed payments such as loans and mortgages. And only* ***you*** *have access to your account.* ***Stop writing checks!***

MUCH MORE THAN A HOME CHECKING PROGRAM

CHECKFREE pays your bills anywhere in the United States—no matter where you live or where you bank! And CheckFree is totally secure. Data entry takes place off-line, only payment information is burst transmitted to the CheckFree Processing Center, and payments are processed through the Federal Reserve System.

CheckFree From TigerSoftware

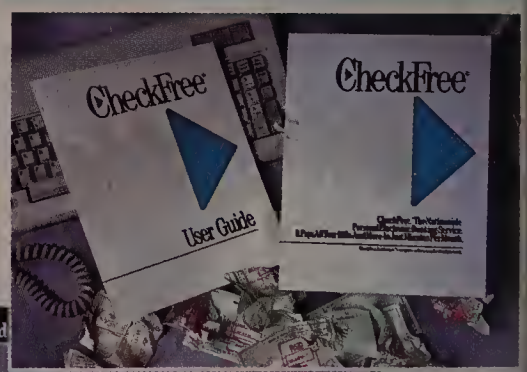
PW 3560 CheckFree 5¼ inch IBM PC and compatibles.....$49.95

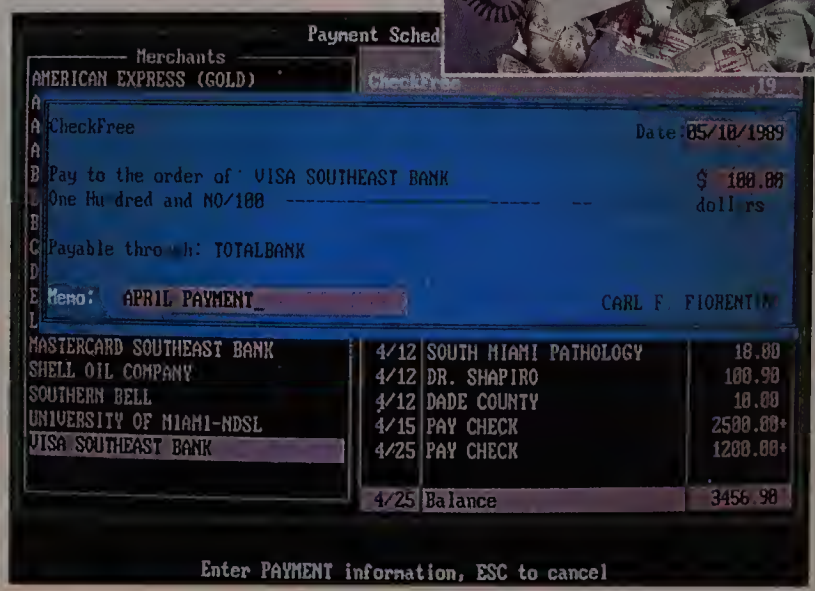
IBM PC, XT, AT and PS/2 with 256K, a Hayes-compatible modem, 2 floppy drives or hard disk. CHECKFREE requires a $9.00 per month fee per 20 checks, and an additional $3 per 10 thereafter (or any portion thereof).

CheckFree $49.95

A QUICK LOOK

✓ Banking of the future—today! CHECKFREE is the new way to eliminate the time-consuming process of writing checks, doing paperwork, reconciling your account, buying postage and mailing your payments.





Just make out the che and you're done—CheckFree handles yo payment!

ORDER BY 3PM (ET) TODAY, HAVE IT BY 3PM TOMORROW! CALL (800) 88-TIGER

READ THIS CAREFULLY IF YOU OWN A HARD DISK.

YOUR HARD DISK IS A TIME BOMB!

Fragmentation is inevitable and fatal! *When your hard disk was new, it ran lean and swift, retrieving files in just a few seconds. But as you added files and programs to it, your hard disk became fat and sluggish—in fact,* ***a fragmented, "dirty" hard disk can take up to 100 seconds to retrieve a file that used to take just 10 seconds****—TEN TIMES SLOWER!*

The problem? Fragmentation kills hard disk performance. It causes excessive head movement across the media, creating bad spots throughout the drive. It's aggravating—and it's dangerous! A fragmented hard disk, left unmaintained, is almost certain to crash. That means major data loss. ***DISK OPTIMIZER 4.0*** *is the standard for hard disk optimization software. Its sleek,* ***easy-to-use menu system*** *makes hard disk maintenance simple.*

1. The New Hard Disk.

This is a new brand new hard disk. As you begin to create files, they are stored on the disk randomly. Each occupies a place on the sparsely-populated disk. At this point, disk performance is at its peak.
A 256K file or program can be retrieved in just a few seconds. Wear and tear on your equipment is minimal.

2. Fragmentation Begins.

As you edit these existing files, DOS will store your additional data in the same random manner. If you delete a file, a "hole" is left where that file had been stored. DOS will fill that hole with parts of other files. Fragmentation has begun. Your hard disk is running considerably slower.
More and more files are added, edited and deleted. There are pieces of your files and programs scattered all over the disk. Your hard disk's head spends more time "dragging" across the surface of the disk, endangering the media—and the data.
Under these conditions, the risk of a hard disk crash is high, and the wear and tear on your disk's moving parts and magnetic media is severe. And it's slower than ever!

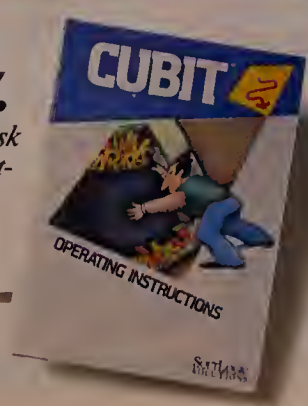
3. After Using Disk Optimizer.

DISK OPTIMIZER assembles the pieces of your fragmented files and stores them as ONE FILE. Just a couple of keystrokes will help your hard disk run up to 300 percent faster! And all of your data is 100% safe. Your hard disk and your data are safe.
DISK OPTIMIZER contains features such as "Data Guardian," that can recover files and unformat accidentally formatted hard disks—plus a dozen new utility features.

Over 250,000 users have discovered that Disk Optimizer saves time and money, while providing complete protection from hard disk errors and erasures.

FREE! WITH DISK OPTIMIZER: 'CUBIT' COMPRESSION UTILITY.

CUBIT safely compresses the data stored on your hard disk up to 70 percent. When a file is called, the data is automatically de-compressed. If your hard disk is nearly full, CUBIT can save you the cost of a new one by compressing your files—by up to 75 percent!



A $69.95 Value!

—FREE Compliments of TigerSoftware

FREE CUBIT WITH DISK OPTIMIZER

Disk Optimizer 4.0
And FREE Cubit *a $69.95 Value*
Just $69.95

A QUICK LOOK

- *Restores speed to your hard disk by eliminating fragmentation of your files and programs. Can increase speed up to 300% and minimize wear on the hard disk. Installs in seconds.*
- *Reduces the risk of hard disk failure. A fragmented hard disk will almost certainly crash at some point.*
- *Contains data and disk recovery features with its "Data Guardian." Undelete deleted files—even restore accidentally formatted hard disks.*
- *Contains 17 easy-to-use utilities.*

MAINTENANCE FEATURES:

TrackSaver *Protects the surface of your disk from excessive wear by preventing the head of the drive from spinning over the same track for too long.*

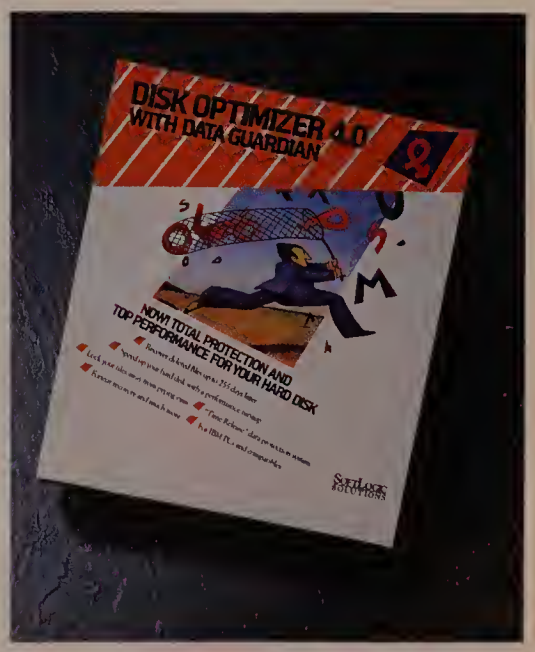
Refresh *Prevents bad spots that develop on disks due to fading magnetic charges.*

Advanced New 'Data Guardian' *Instantly restores an accidentally deleted file, directory or hard disk—up to 255 days after it was erased! Accidentally format your hard disk? Just select Data Guardian's UNFORMAT feature and it's instantly restored!*

Analyze *Graphical displays show you how much fragmentation has taken place on your hard disk.*

KillFile *Completely delete sensitive files to prevent unauthorized access.*

FindFile and FilePeek *Misplace a file? FindFile will perform a "wildcard" search with just a couple of keystrokes.*
Then get a "quick look" with FilePeek.



DISK OPTIMIZER 4.0 AND FREE 'CUBIT'

PW 3280 Disk Optimizer 4.0—IBM 5¼ inch...$69.95
PW 3285 Disk Optimizer 4.0—PS/2 3½ inch..$69.95
Runs on IBM PC and compatibles. Supports DOS 4.0.

CALL (800) 888-4437

FREE FEDERAL EXPRESS SHIPPING CALL TO ORDER (800) 888-4437

If You Use LARGE Spreadsheets, Document Files Or TSRs—Don't Buy An "AboveBoard", Get "AboveDISC!"

GET UP TO 32Mb OF EXPANDED MEMORY—WITHOUT BUYING ANY HARDWARE!

AboveDISC 3.0. Convert Extended Memory And Hard Disk Space Into Expanded Memory—For Just $99.95!

FREE SHIPPING! FEDERAL EXPRESS VIA FEDERAL EXPRESS! Call By 3PM Today, Have Your Order Tomorrow (800) 88-TIGER

BREAK THE 640K BARRIER with AboveDISC *Now you can run memory-hungry applications like large spreadsheets, large desktop publishing and text files, Windows, "new-generation" TSRs—even more sophisticated CAD drawings—**without buying any new hardware—saves expansion slots!** It's ideal for laptops.*

*AboveDISC actually utilizes previously unused portions of your Extended Memory located on the motherboard—**OR employs your hard disk**—to **simulate EXPANDED Memory.** It accesses up to 32 megabytes of paged memory and supports EMS 3.2 and 4.0.*

*You could spend $1000 for just ONE MEGABYTE of Expanded Memory—or you could buy AboveDISC—**and get up to 32 MEGS**—for just **$99.95!** If you use a PS/2 with 1 or 2 megabytes of Extended memory, and want to fully utilize it—or if you're on a network (like 3Com) and have problems using menuing or accessing programs, or if you'd like to increase the RAM capacity of your current PCs, XTs and ATs—AboveDISC is the ideal, **inexpensive solution** (without sacrificing precious expansion slots). Installs in seconds.*

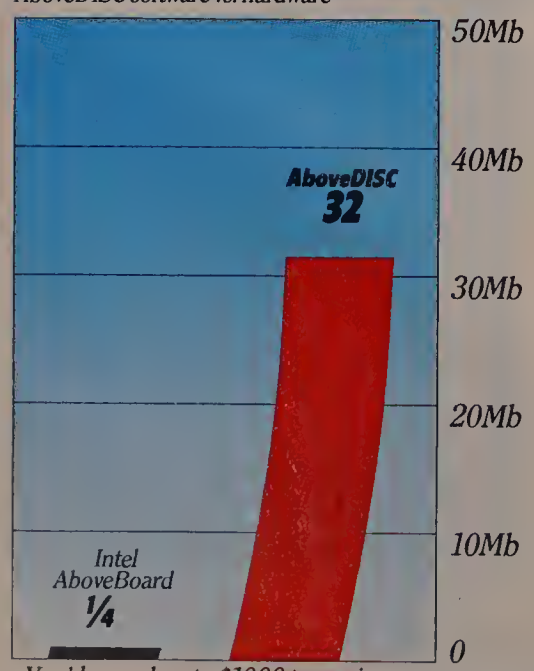
AboveDISC TURNS YOUR HARD DISK INTO EXPANDED MEMORY!

AboveDISC seeks out all the memory available on the motherboard beyond 640K, all the RAM on your extended memory board (much of it completely unused), or up to 32Mb of memory on your hard disk and uses it to simulate expanded memory. So you'll use memory you simply never had before—*to run faster, more powerful applications and create larger spreadsheets, drawings or databases.*

WHY PAY THE ASTRONOMICAL PRICE OF MEMORY BOARDS?

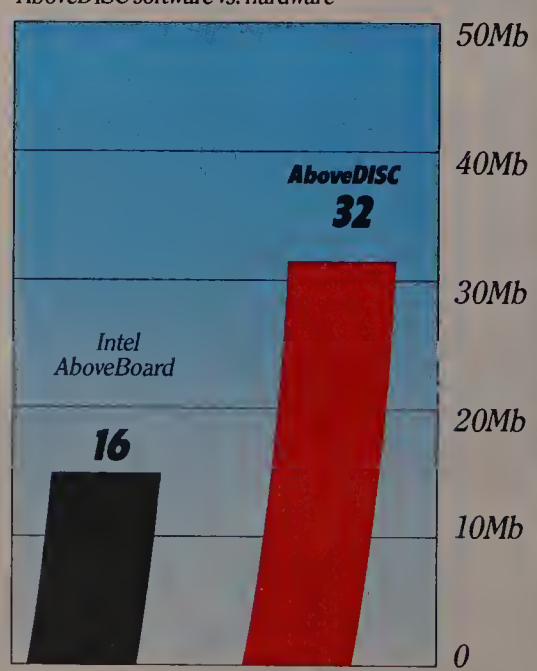
...When for just $99.95, you can simulate Expanded Memory—and get the same fast, smooth proformance. Here's a comparison of AboveDISC software vs. hardware.

MEGABYTES PER 100 DOLLARS
AboveDISC software vs. hardware



You'd spend up to $1000 to equip your system with Intel's AboveBoard—and get ¼ meg of Expanded Memory per $100, vs AboveDisc's 32!

POTENTIAL CAPACITY
AboveDISC software vs. hardware



With the Intel board, you're limited to 16Mb of Expanded Memory. With AboveDISC, you can gain up to 32 and use the larger programs!

AboveDISC 3.0 $99.95

A QUICK LOOK

- *Beyond the restrictions of conventional memory lies faster, more powerful programs—but **the cost of expanded memory is prohibitive.***
- *AboveDISC finds unused memory within your system, and **utilizes your hard disk to simulate expanded memory—up to 32 megs!***
- *Installs in seconds, runs on any IBM-compatible computer. Saves precious expansion slots. Ideal laptop accessory.*
- *Supports LIM 4.0 and 3.2 standards.*

HOW ABOUT COMPATIBILITY? AboveDISC is fully compatible with: *Lotus 1-2-3, Symphony, EXCEL, Windows, Paradox, Quattro, Reflex, AutoCAD, Framework II, PageMaker* and more, call us for compatibility details.

And AboveDISC is transparent, so if your machine runs at 25Mhz, so does AboveDISC!

So before you retire your extended memory card or junk the non-expandable machine, try AboveDISC—and save a bundle!

AboveDISC
Expanded Memory Simulator

PW 6550 AboveDISC IBM 5¼ AND 3½ inch.....$99.95

Runs on IBM PC, XT, AT, PS/2 and compatibles. Requires 256K memory. Uses as little as 14K of lower 640K memory.

ORDER BY 3PM (ET) TODAY, HAVE IT TOMORROW BY FEDERAL EXPRESS! CALL (800) 88-TIGER

NOW IT'S AS EASY TO CHANGE SOFTWARE AS IT IS TO CHANGE CHANNELS ON YOUR TV!

Load Up To 12 Programs At Once And Simply "Hot-Key" Between All Of Them.

Make All Of Your Programs "RAM-Resident"

Imagine being able to switch instantly from one program to another! *Let's say that you're working with your word processor and you need to check a figure in your spreadsheet. Normally, you'd have to exit your word processor, start your spreadsheet, load the necessary file, jot down the numbers you need, save and exit the spreadsheet. Then, you would have to start your word processor again, reload your file, find your place and continue working. Whew! That's a lot of work!*

Saving, exiting, staring, loading and retrieving are eliminated! *Software Carousel installs in seconds and allows you to change programs and files as quickly and easily as you change channels on your TV. So, in our example above, you could have "hot-keyed" from your word processor to your spreadsheet file, got the information you needed, and with one keystroke, you're back in your word processor—in the exact spot you left off!* **Replace 10 time consuming steps with just 2 keystrokes.**

ALLOWS INSTANT ACCESS TO ALL POPULAR SOFTWARE Software Carousel is compatible with virtally every PC program, application and utility on the market today—word processors, spreadsheets, databases, RAM utilities and others. You can even load more than one copy of the same program, like multiple 1-2-3 spreadsheets or two SideKick notepads.

IT WILL NOT "GOBBLE" YOUR MEMORY! Would you be amazed to learn that Software Carousel requires just 11K (as a memory-resident extension of DOS) to achieve such efficiency? It's true.

Just insert the diskette and type "carousel." Then load all of the programs you'll be working with. By keeping your programs in a special area of memory, you'll access ALL available memory for all programs and files.

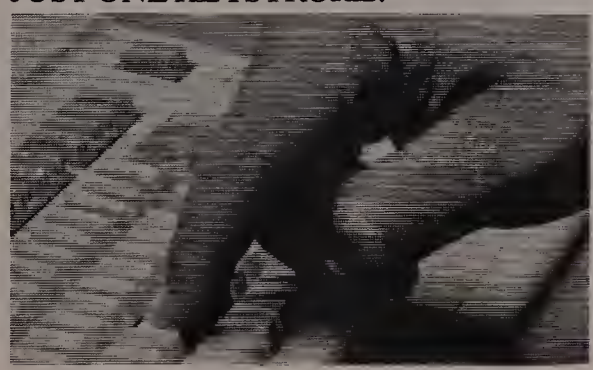
EASY TO INSTALL, LEARN AND USE No complex installation required. Just type "carousel" and load your software as you normally would.

So simple, anyone can use it.

UNIQUE "AUTOMATIC SETUP" Software Carousel automatically remembers your setup and repeats it each time you start your computer.

STREAMLINED MENUS Anyone can save time with Software Carousel—use the convenient on-screen menus or directly from keyboard commands.

HOT-KEY BETWEEN UP TO 12 PROGRAMS! Load up to 12 different programs, or load multiple copies of one program! Switching between them requires JUST ONE KEYSTROKE!



Software Carousel makes all of your applications RAM-resident, eliminating time-consuming steps.

IF IT RUNS ON YOUR PC, IT RUNS WITH SOFTWARE CAROUSEL Run any program, even RAM-resident utilities such as SuperKey, ProKey and SideKick—at the time—without conflict!

FREE! MAGIC MIRROR

Select data from your PC screen and instantly integrate it into any other program. Data is instantly re-formatted! It's 100% safe.

Magic Mirror
A **$99** *Value!*

Compliments Of TigerSoftware

Software Carousel With FREE 'Magic Mirror' Just $89.95

A QUICK LOOK

- *Simple to install and use. Software Carousel allows you to switch from one program to another—with one keystroke. Saves time—you don't need to save and exit files before switching.*
- *Occupies just 11K RAM.*
- *Run SideKick, SuperKey and Prokey—at the same time—with no interference or conflict at all.*
- *Go from spreadsheet to database to word processor—in seconds!*
- *Supports expanded and extended memory boards.*

FREE—MAGIC MIRROR.

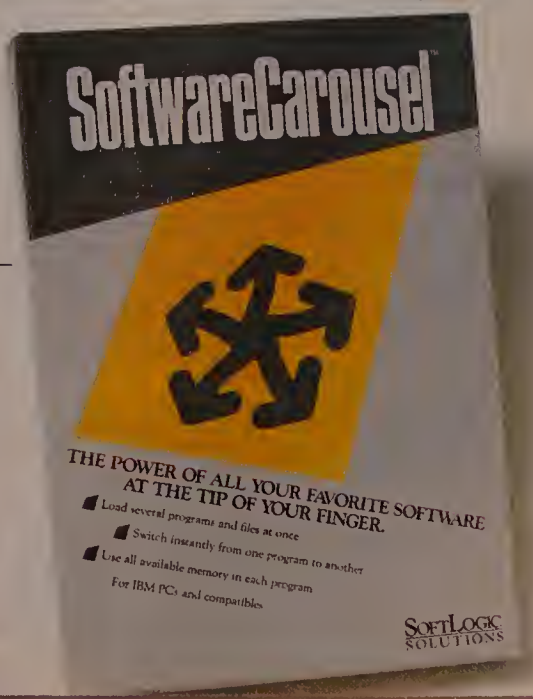
Using Software Carousel, you can gain instant access to any file with just one keystroke. Add the data integration of Magic Mirror, and you could, for example, prepare a letter in your word processor, switch to Lotus 1-2-3 and find a column of numbers, highlight it on the screen, store it, switch back to your word processor and integrate it into your document.

In effect, Magic Mirror makes data from all PC software compatible with data from all OTHER PC software!

This is a perfect combination package for anyone who uses many different software applications throughout the work day. You'll save time, because Software Carousel eliminates repetitive, time-consuming tasks. You'll be more creative using Magic Mirror to integrate any information into your final documents.

SOFTWARE CAROUSEL
With FREE Magic Mirror

PW 3300 Software Carousel—IBM 5¼-inch....$89.95
PW 3305 Software Carousel—PS/2 3½ inch...$89.95
Runs on IBM PC and compatibles. Supports DOS 4.0.



SOFTWARE CAROUSEL AND MAGIC MIRROR

A Database For The Squeamish! Fast, Easy—And Just $89.95!

Somebody Show Me A Database That I Can Just Sit Down And Use... —And I'll Buy It!

We'll go one better—Introducing PC File:dB, an easy-to-use powerhouse that's ready-to-run—and inexpensive!

Whether you are a database beginner and need to generate mailing labels and prepare simple reports, or a seasoned veteren, and want to quickly organize inventory or large mailing lists, PC File:dB is the painless solution.

In minutes, you can create lists for any purpose, from part numbers to personnel records, customers, prospective customers, contributors or associates.

Select the sleek graph and chart maker—and quickly create horizontal and vertical bar graphs, stacked bar graphs, pie, line and scatter charts—even 'exploding pie wedges' and multiple pies. Just a few keystrokes turns a set of 'crunched' numbers into very powerful graphic statements!

Managing mailing lists and producing customized letters is downright simple, just select from the menu-driven screens!

When You Say It's Easy To Use, How 'Easy' Do You Mean?...

The answer lies in PC File: dB's unique menu system. Each screen is impeccably designed, logically arranged—without a lot of cryptic jargon. Context-sensitive help screens offer constant guidance, and an innovative "teach mode" that automatically displays a help screen for every step—you simply cannot get lost!

What Else Can I Do With PC File: dB?

- *Customize your entry screen.*
- *Place fields anywhere on the screen. (including titles, prompts, boxes, etc.)*
- *Mail-merge form letters.*
- *Create up to 10 indexes for each database. (PC File: dB automatically updates for each.)*
- *Sort on up to 10 fields—ascending or descending. Sort selected records. Browse up to 20 records at a time.*
- *Password protect individual features.*

PC File: dB $89.95

A QUICK LOOK

- *Technically excellent and thoroughly enjoyable to work with, this is the 'wolf in sheep's clothing' of databases. Simple to use, it pours on more power than virtually all of its competitors.*
- *Organize your mailing lists, sort on up to 10 levels, produce instant mailing labels and perform easy mail-merge.*
- *Produce great reports—use any existing data with a host of menu driven import/export features.*
- *Incredible capacity! One BILLION records, A maximum record length of 4000, a maximum field length of 254 (memo fields: 5000), and 70 relational fields per database.*

Finally, An Easy-To-Use Database With Power To Burn!

PC File: dB

PW 9070 PC File:dB 5¼ IBM $89.9

IBM PC, XT, AT, PS/2 and compatibles with 416K RAM
NOTE: hard disk required.

Use Existing dBASE Files.

This package is a perfect companion to dBASE—read dBASE files or create new files for later dBASE use.

Eliminates the need for complex conversion programs. Even if you don't use dBASE, this intuitive, menu-driven database program boosts productivity with an absolute minimal investment of time.

Professional Chart And Graphs Made Simple.

Illustrate your ideas! Produce bar, line, scatter and pie charts more easily than you've ever imagined possible.

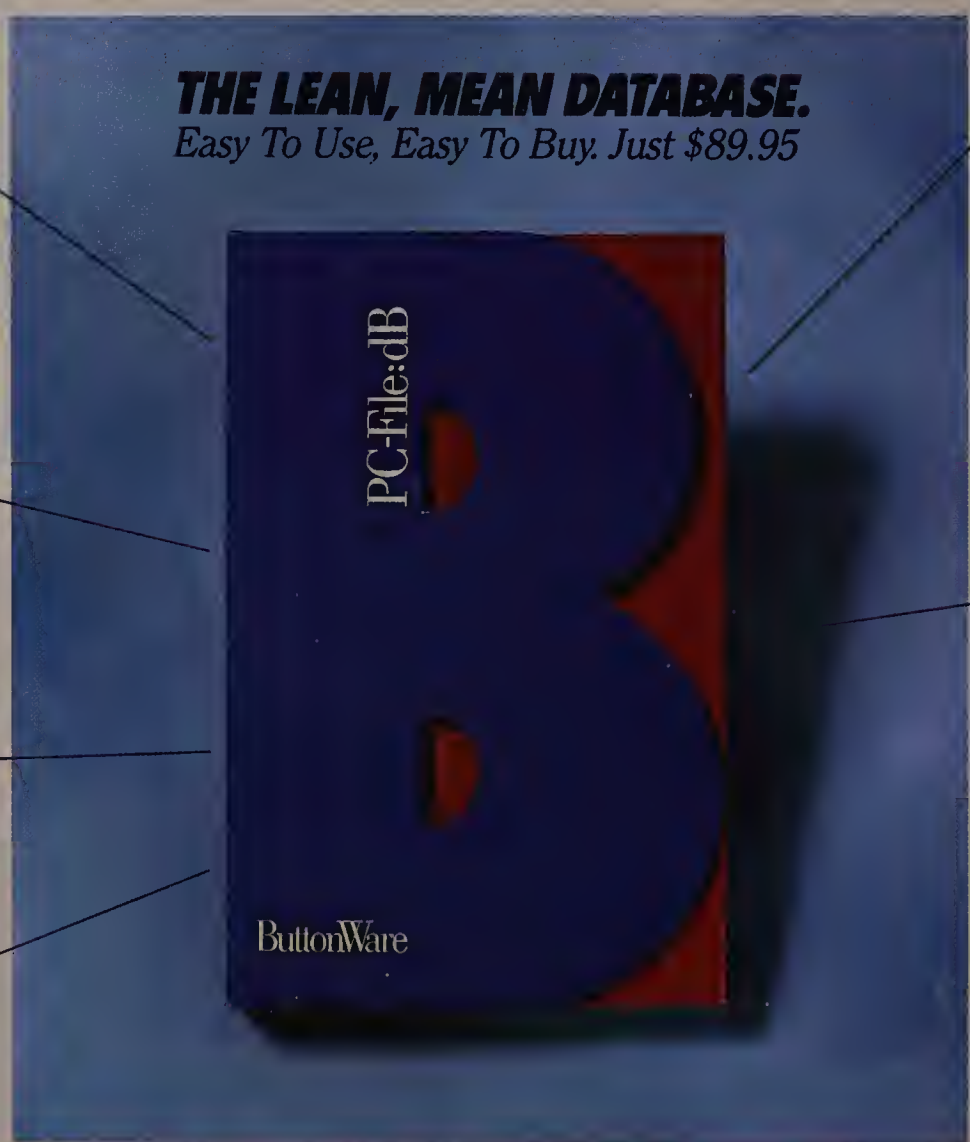
Bar chart options include vertical, horizontal, cumulative and stacked. Graph multiple variables by just entering them!

Exchange data...

...With programs like WordPerfect, WordStar, Lotus 1-2-3, Microsoft Word, Microsoft Works, Excel and many others.

Unlock The Raw Power Of PC File: dB's SEARCH Features.

Just select or type in what you need, and PC File: dB finds it! Performs generic, soundex, wildcard and imbedded searches.



The Fastest, Easiest Report Preparation—From Simple To Sophisticated.

PC File: dB really shines when it comes to producing reports.

Be creative! Paint your report formats on the screen and save them for later recall and editing.

Select from the menu, and you can include printer control codes, page breaks, calculations, look-ups, page numbers and dozens more.

Can Handle One Billion Records!

No other database comes close! Yet PC File: dB is far easier to learn and use than traditional database programs.

Instantly delete duplicates and un-delete, if necessary.

Set up macros quickly from the menu and execute DOS commands at any time.

"There is no better value in database products. It's put some fun back into doing my database chores. You'll love the graph and chart makers."

—Carl F.

FOR MORE INFORMATION, OR TO ORDER, CALL TOLL-FREE (800) 888-4437

FLEXIBLE AND FAST—AN INDISPENSIBLE TOOL!

ORGANIZATIONAL CHARTS, PROCEDURE DIAGRAMS, FLOW CHARTS AND MORE!

***TERRIFIC!**—A visually-oriented package that allows you to quickly create organizational charts—a crucial management tool—for use in policy making, responsibility delegation, authority levels, sales presentations, flow charts, procedure diagrams, 'decision trees' and more. Sleek, easy-to-use box drawing capabilities—just type your text and one keystroke draws a box around it! Group boxes with another keystroke and revise charts in seconds. Change paper—and TERRIFIC adjusts the chart size automatically! On-screen WYSIWYG display!*
***FREE**—TERRIFIC! Laser Font-Pack—A $29.95 value.*

TERRIFIC! $79.95

A QUICK LOOK

*A fast, easy-to-use package that creates clean, professional-looking **organizational charts**—or any type of chart! Just type text and one keystroke draws a box around it—with every corner crisp. Features page preview and unique "**Make Pretty**" feature that automatically refines and properly spaces your chart.*

TERRIFIC! Organization Chart Maker

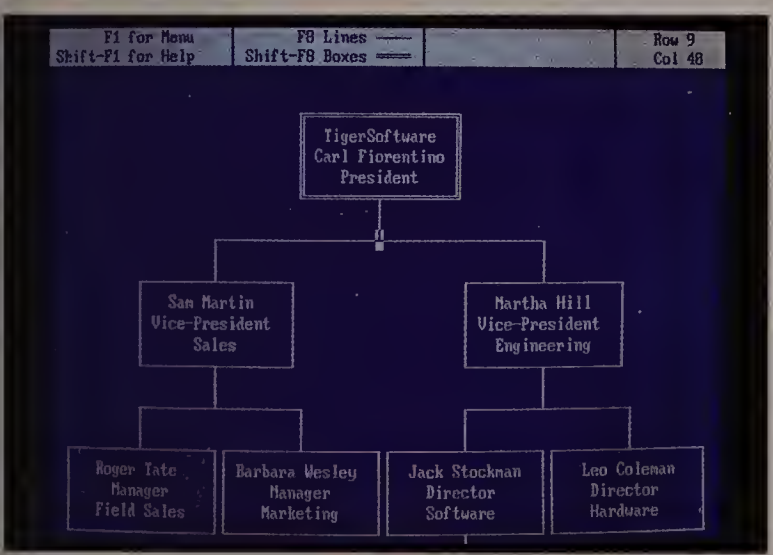
With FREE Laser Font-Pack!

PW 4950 TERRIFIC! IBM 5¼-inch.....$79.95
PW 4955 TERRIFIC! PS/2 3½ inch.....$79.95

IBM PC, XT, AT, PS/2 and compatibles with 256K RAM. Support virtually any dot matrix printer—including the HP LaserJet Plus or Series II

IT'S EASY TO LEARN AND USE There are no rigid formats or pre-defined templates that you must work within. Just start typing. TERRIFIC! will automatically justify your text and draw boxes around it. Put the finishing touches on your first chart minutes after opening the box!

CREATE ANY TYPE OF CHART TERRIFIC! draws with speed and ease, so you can chart any concept. Business professionals everywhere are putting 'the power of the chart' to work for them.



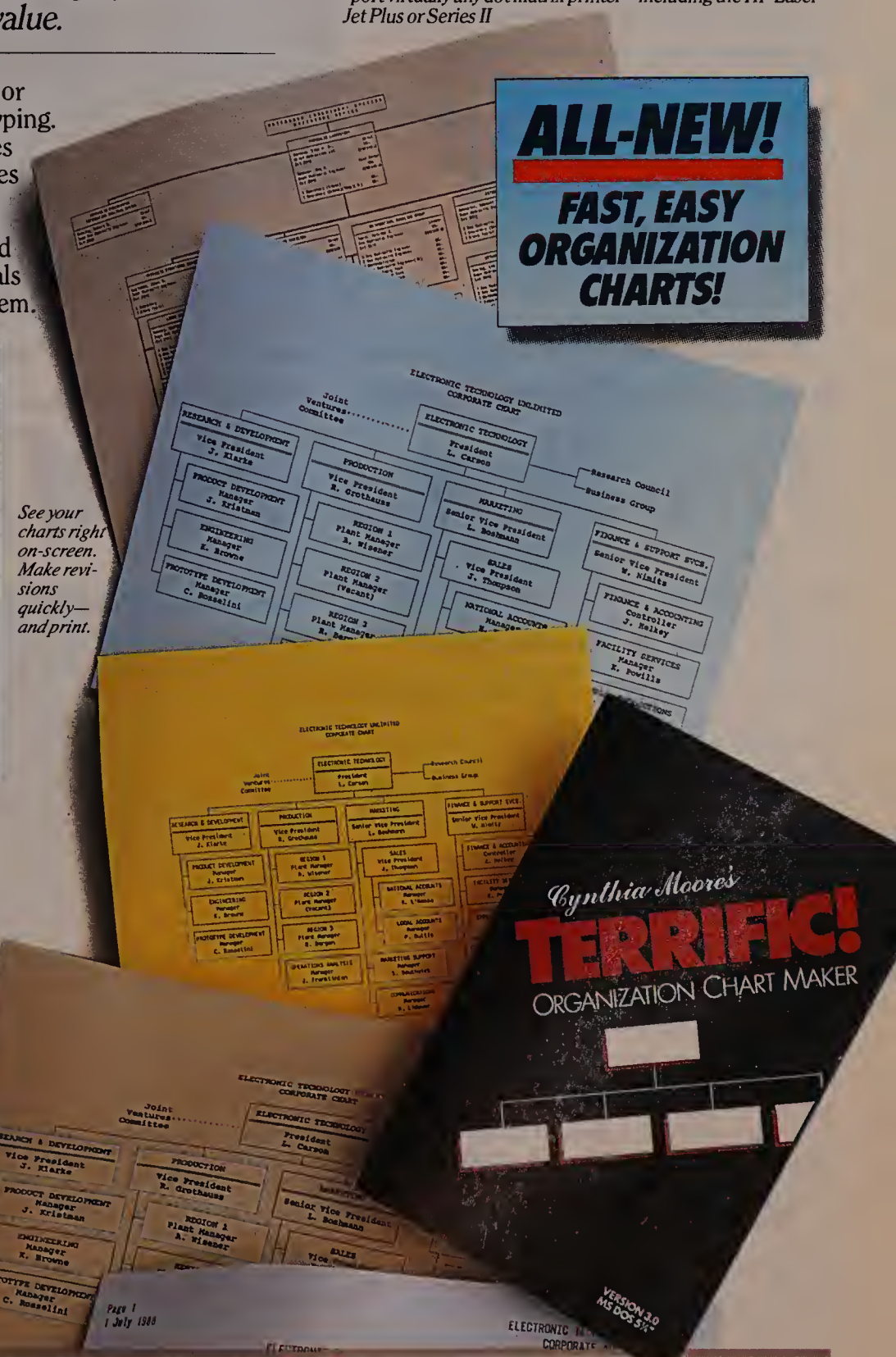
'FREE FORM' CHART DESIGN

TERRIFIC! allows you to decide how to structure your chart, using a sleek menu

UNIQUE "MAKE PRETTY" FEATURE Once you've completed the layout of the chart, TERRIFIC! will automatically perform a last minute "clean-up" before you print. This feature centers text, centers lines and aligns boxes. It even consistently spaces the elements of the chart.

INCLUDES LASER FONT-PACK—FREE! Enhance your laser-generated organizational charts with this easy-to-use add-in! The Laser Font-Pack includes two additional typefaces (Courier and Modern Letter Gothic) and allows four additional sizes ranging from tiny (25 cpi) to oversize (8 cpi). All fonts supplied in normal and sideways formats.

Create giant charts for use as visual aids for presentations and meetings— up to 4½ feet by 3 feet by using the quick 'cut and paste' feature.



See your charts right on-screen. Make revisions quickly—and print.

CALL TOLL-FREE TO ORDER—OR FOR MORE INFORMATION (800) 888-4437

The Fast, Easy Way To Transfer Files Between Laptop And Desktop PCs.

LAPLINK III Transfers files at incredible rates of speed between your laptop computer and your desktop PC—or between your Macintosh and your PC—in seconds.

Features an innovative "six-headed" cable that allows you to transfer files using either a ***serial*** *or* ***parallel port****—parallel transfers can typically reach speeds of 500,000 baud or greater, serial transfers can reach speeds of 200,000 baud.*

Sets Up In Seconds.
LAPLINK is ready to use—right out of the box. Just connect the universal cable to your laptop and desktop (or any two IBM compatible PC's or PS/2's). Type LL3 on both keyboards—and you're connected!

The Secret Is The Six-Headed Cable...
Transfer files, directories or entire hard disks of information (in either direction) at blistering speeds. LAPLINK III's new "six-headed" cable handles serial and parallel modes. No other system has it!

Tag It, And Transfer It.
'Tag' certain files or subdirectories to be transferred—save time and disk space by transferring only new or updated files.

LapLink III And LapLink Mac

PW 5550 LapLink III IBM $139.95
PW 5500 LapLink Mac $139.95

LAPLINK 3 contains 3½ and 5¼ disks and cable, 256K.

LAPLINK III $139.95

A QUICK LOOK

- *LAPLINK III allows you to quickly connect and transfer files between your laptop (3½-inch) and your desktop PC (5¼-inch).*
- *New "6-headed" cable allows serial and parallel transfers—speeds up to 500,000 baud—100,000 characters per second!*

A Portable Information Manager. Introducing...

The Hand-Held PC!

Just $99.95—But You'd Better Hurry! *The DataStor 8000 is the latest innovation in state-of-the-art technology. Its large memory capacity allows you to enter up to 128 characters per entry. Your information can be saved in DataStor for later use, or you can easily transfer data to your IBM or compatible PC (or another DataStor) using an adapter cable that is included. So names you collect at a convention using DataStor can be transferred into your permanent database for use in follow-up mailings.*

The ideal gift for the traveller.

Hand-Held Computing.

The remarkable new DataStor 8000 replaces your notepad, desktop organizer, appointment calendar and stand-alone calculator. In fact, with 8K of available memory, it's like having a PC—in your pocket! But what makes the DataStor 8000 so convenient is its ability to actually transfer data to an IBM or compatible desktop PC.

DataStor includes eight mode indicators that light up in the LCD displaying the mode in use. It also includes a full-function calculator and time/date indicators.

The 16 message alarms can be pre-set up to a year in advance. They can alert you to appointments, birthdays etc. When the time and date of your message occurs, DataStor sounds a 20 second tone, during which the pre-programmed message appears in the easy-to-read LCD screen.

DataStor also includes a security feature that insures your entries will remain private. There is also a back-up feature to protect data when changing batteries.

It's like having a Rolodex,® and a DayTimer® in a convenient hand-held format.

Download notes, numbers and PC software

- *DOWNLOAD SOFTWARE like SideKick, dBASE and most word processors.*
- *ELECTRONIC SCHEDULER Plan your day with a daily organizer. Quickly "jot down" notes or memos anytime.*
- *PHONE/ADDRESS DIRECTORY Store ALL of your names and addresses for instant access—or enter new ones and download to your desktop PC later.*
- *MESSAGE ALARM Preset up to 16 reminder alarms—for appointments, phone calls or engagements—up to a year in advance!*
- *CALCULATOR/CLOCK Check time, date*

Technical Features:

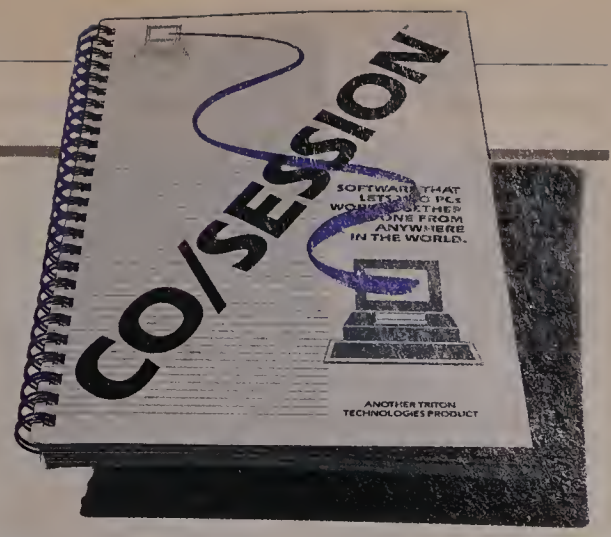
- *The DataStor 8000 includes a databank, data exchange software for use with your desktop IBM PC, XT, AT PS/2 or compatible, and cable.*
- *Includes Personal Organizer Software—Set up a cutomized planner to fit your needs.*
- *Large 20-character screen* ✓ *8K capacity*
- *7951 characters (395 name and number entries).*
- *Security codes to keep entries private*
- *Auto-OFF after 2 minutes* ✓ *Battery back-up*

The Amazing
DataStor 8000
Pocket PC

PW 2480 DataStor w/software and cable..$99.95

Leather-like case, cable, battery and back-up battery included.

ORDER BY 3PM (ET) TODAY, HAVE IT BY 3PM TOMORROW! CALL TOLL-FREE: (800) 888-4437



OPERATE ANY COMPUTER—ANYWHERE IN THE WORLD, BY REMOTE CONTROL.

CO/SESSION *Allows you to quickly connect your computer to a distant PC (on a phone line) and run that remote computer as if you were right here—at the keyboard! From a laptop in a hotel room, you can control your PC back at the office—even if it's more powerful—provide training, or troubleshoot a customer's PC (or software system) from your office. You can even print documents on either, or both systems simultaneously. And CO/SESSION 4.0 includes an all-new "**windows-like**" interface for speed and convenience, plus error-checking, seven advanced new security features, EGA, VGA and Hercules support (for graphics) and much more. The best package available for **remote computing, remote customer support, background file transfers and remote network access**. Easy to use—just install it—CO/SESSION sits in the background using only **51K.***

*And CO/SESSION transfers files up to **20 percent faster** than even its closest competitor—with screen updates over **400 percent faster!***

CO/SESSION 4.0 $199

A Q U I C K L O O K

*CO/SESSION allows users to run a PC in a remote location—anywhere—via a modem, from their PC. Perfect for laptop users on the go who need to transfer data—even run applications while away. CO/SESSION is streamlined, **simple to use** with an all-new "windows-like" interface, unmatched speed, error-checking, convenience and security.*

A Comparison of Background Functions

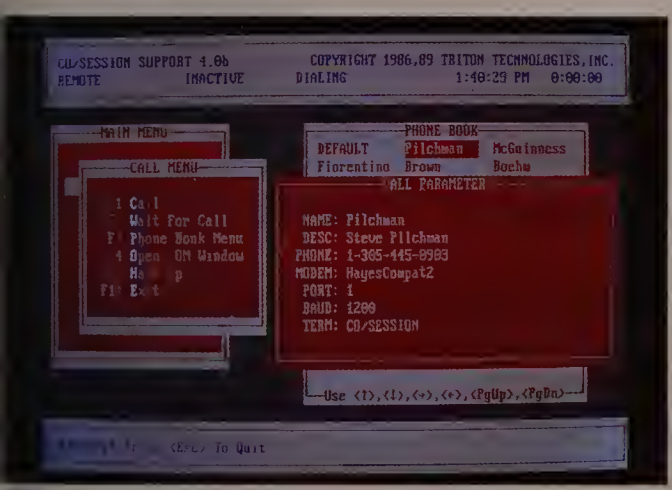
	CO/SESSION	Carbon Copy	CloseUp	pc ANYWHERE
Transfers Files	YES	YES	NO	NO
Change Directories	YES	NO	NO	NO
Display Directories	YES	NO	NO	NO
Display Files	YES	NO	NO	NO
Delete Files	YES	NO	NO	NO
Rename Files	YES	NO	NO	NO

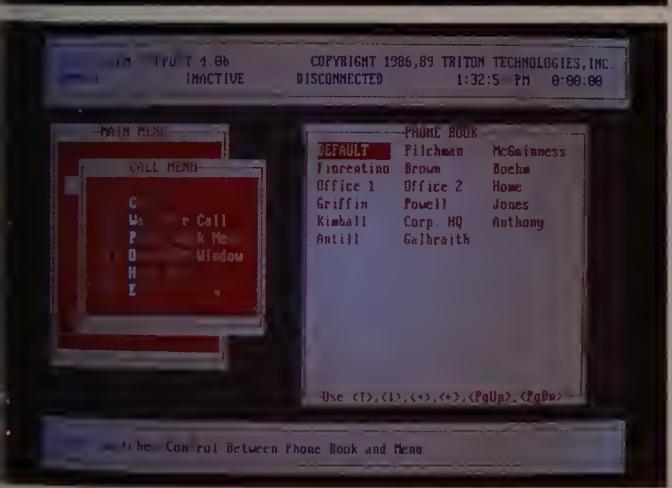
CO/SESSION transfers files up to 20% faster—updates screens up to 400% faster than competitors!

In fact, CO/SESSION was proclaimed "Fastest Remote Software Package" by Infoworld in March, 1989!

EXAMINE THE TREMENDOUS ADVANTAGES OF THIS EASY-TO-USE, CRITICALLY-ACCLAIMED REMOTE CONTROL PACKAGE The future of computing hinges on the concept of connectivity. The ability to access computers from a remote location opens a world of productivity that until now, has been unimaginable.

CO/SESSION 4.0 runs in the background of both machines until called up by using hot keys. Both the remote (your computer) and host computer (the computer you're calling) can initiate calls using the convenient dialing directory. You'll control the distant PC with speed, safety and convenience. And CO/SESSION is fully compatible with all leading software like Lotus, WordStar, WordPerfect, dBASE IV, SideKick, Norton Utilities, etc. Imagine the time savings you'll enjoy working on your office PC—**from your home!** You can print documents, transfer files—even work together with an associate or customer—remotely!





"Windows-Like" Interface—with easy to use, pop-up menus.

PRINTING FEATURES *With CO/SESSION, printer output can be directed to the host and remote machine—simultaneously. The remote user may, if necessary, spool the output later printing.*

VOICE/DATA SWITCHING *Toggle back and forth between voice and data (using just ONE phone line), or, start with a voice call, load CO/SESSION during the conversation, then switch directly to a CO/SESSION data connection. It also offers a COM port window—handy when setting up a non-Hayes modem. A "chat window" allows users to send and receive messages on-screen.*

SMOOTH, FAST FILE TRANSFERS AND ERROR-CHECKING *Copy data files in both directions—so you can work at home—without transporting diskettes!*

And CO/SESSION's powerful error-checking capabilities allow you to call up your office PC and copy an entire APPLICATION FILE to your home computer!

ADVANCED SECURITY CO/SESSION protects your data with features like: dual-passwords, password-checking and data encryption. You can restrict the ability to send or receive files on the remote PC, blank the other computers' screen—even disable its keyboard to prevent unauthorized access. So if you're doing support on a remote PC, you can work in complete privacy—users or passers-by will not be able to see what you're doing. And CO/SESSION includes a "dial-back" feature that provides an additional level of security and reverses phone charges (for long-distance sessions) and unmatched error-checking for data safety.

'RECORD' REMOTE SESSIONS Record screen sequences within a session for playback later. You can even pause within a session and playback earlier transactions—great for training and system troubleshooting. The recorded information (including date, time on/off, name and phone number) can be imported into a word processor for billing or documentation purposes.

CO/SESSION Remote Control Software From TigerSoftware

PW 3800 CO/SESSION (2-user) IBM 5¼-inch.....$199
PW 3805 CO/SESSION (2-user) PS/2 3½ inch.....$199

Runs on the IBM PC, XT, AT, PS/2 and compatibles with 256K RAM (host PC requires only 50K). It will support virtually any dot matrix printer—as well as lasers.

FOR MORE INFORMATION ABOUT THIS PRODUCT, OR TO ORDER, TOLL-FREE (800) 88-TIGER

ORGANIZE, CREATE CUSTOM LABELS, AND PRODUCE REPORTS FOR YOUR ENTIRE LIBRARY OF DISKETTES!

DISKETTE MANAGER 3 helps you print labels (both 5¼ inch and 3½ inch) and generate library reports for everything on your diskettes. Just read your diskettes into the system; each diskette directory (including subdirectories) is instantly cataloged, you can then print labels and reports showing the contents of every diskette—or your entire library.

DISKETTE MANAGER 3 will accept all diskette types and sizes recognized by DOS including 5¼ or 3½ inch, fixed disks, tape backups, 360K, 720K, 1.2 Mb, 1.44 Mb, etc. Catalogs of your files can be created to contain up to 500 diskettes and 32,000 files. You can choose from several predesigned label formats for your diskettes, or design your own.

FREE
100 5¼" and 100 3½" blank labels.

PRINTER SUPPORT All printers are fully supported. All printer codes, font types and sizes may be used for printing labels.

CATALOG CAPACITY Each catalog may contain up to 500 diskettes and 32,000 files. An unlimited number of catalogs can be created. Catalog size limited only by disk space. Diskette Manager 3 will print any label that your printer will accept. The diskette title will hold up to 20 characters (upper and lower case). The date and sequential serial numbers may be automatically added.

File names can occupy up to 66 lines on a 4" x 1½" label and unlimited file names using additional labels. Comments can occupy up to eight 57-character lines,

Diskette Manager 3 From TigerSoftware

PW 2220 Diskette Manager 3 (5¼ and 3½).....$49.00

Now Just $49

IBM PC, XT, AT, PS/2 or compatible with 256K RAM, 2 diskette drives or one diskette drive and a hard drive, or any laptop (3½). Works with any parallel or serial printer. The number of files that may be listed on a label is a function of the character size available on your printer.

Everything You Need To Know About DOS...

Learn DOS Hands-On! The Fast, Informative, Fun Way To Get The Most From Your Computer!

DS TUTOR presents a very simple, systematic approach to learning the Disk Operating System on your PC. It's easy to understand, and it leads you into a well-rounded awareness of DOS and its vast power and numerous possibilities.

DS TUTOR is great for beginners, or as a refresher course.

Hands-On DOS Training DS Tutor uses plain and simple language to help you develop your understanding, skills and confidence in using DOS. And this complete training program covers all possible hardware configurations. You'll learn about the modern database, spreadsheet and word processing systems as well as Random Access Memory (RAM), batch files techniques, and more.

All sections provide detailed information on specific hardware and software applications in the PC environment.

FREE BONUS— DS HELP!

An on-line reference system to explain any DOS command. With just one keystroke, this program explains such functions as Alternate Path Searches, Backup and Restore Disk, and dozens more.

DS TUTOR

PW 1480 DS TUTOR PC 5¼ Diskettes $49.95

Requires minimum 256K RAM. Supports color.

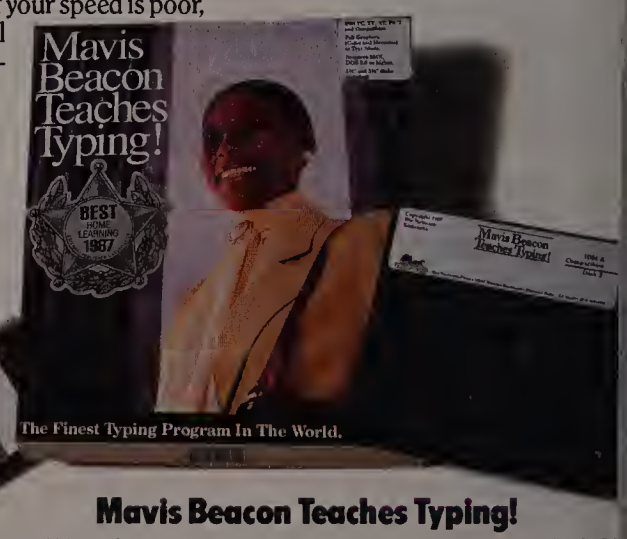
Learn To Type With The Finest Typing Program In The World.

So fast and easy—you'll be touch typing with speed and accuracy in just a few short lessons! MAVIS BEACON TEACHES TYPING! is the premiere touch-typing self-help program that uses carefully planned lessons and drills—perfect for beginners, or typists who want to improve their speed and accuracy.

***Four different "learning centers"** provide an entertaining, informative experience. This program was awarded The Software Publisher's Association "Best Home Learning Software of 1987."*

TYPE FASTER AND MORE ACCURATELY MAVIS BEACON TEACHES TYPING! begins by outlining the lesson plan and evaluating your typing for speed, accuracy or particular problems. A chalkboard appears on the screen displaying Mavis Beacon's comments. From there, each lesson is custom designed to work on these problems. If your speed is poor, MAVIS BEACON will prescribe drills for increasing speed. If accuracy is your weakness, MAVIS will help you work on that.

Includes FREE— Resume Writer



Mavis Beacon Teaches Typing!

PW 1490 Mavis Beacon 5¼ inch $39.95

IBM PC, XT, AT, PS/2 and compatibles. Requires 256K.

FOR MORE INFORMATION ABOUT THIS PRODUCT, OR TO ORDER, CALL TOLL-FREE (800) 88-TIGER

STOP WAITING (...AND WAITING) FOR YOUR PRINTER!

Now You Can Run Your Printer—While Working (at top speed) On Your PC.

PrintRite allows users to run print jobs of any size—while continuing to work, at top speed, on your computer. *PrintRite spools your print jobs to disk (and compresses them), allowing applications to generate print jobs at maximum speed—and save hours of printing time—and it occupies less than 50K memory. Spend time working—not waitingfor prin jobs!*

DESIGNED FOR EASY, EFFICIENT OPERATION PrintRite automatically intercepts printer output and immediately spools it to disk (not to RAM). Your print job runs quickly and efficiently in the background, out of the way, freeing up your computer—so you can keep working—instead of waiting!

PrintRite utilizes advanced 'time-slicing' techniques to offer PC users the benefits of multi-tasking. Pop it up anytime and see a status report on your print job—you can even re-arrange the print queue (a list of jobs waiting to print) —while you work.

FORMS ALIGNMENT, MULTIPLE PRINTER SUPPORT PrintRite will prompt you for alignment of the first page, or every page of your documents. Forms are always perfectly aligned, re-run reports at any page, and stop or start a print job at any time if you need silence.

Control up to five different printers—PrintRite will let you switch between printers and fonts on a per document basis—automatically—while you work on something else.

SPOOLING TO DISK FOR MAXIMUM SPEED AND EFFICIENCY PrintRite automatically groups types of printing jobs together (like spreadsheets, text, graphics and sideways jobs) for more efficient use of the equipment.

Spooled files are compressed to save disk space and prevent loss of data that can occur with other memory print buffers. PrintRite guarantees 100 percent protection of every bit of your data—even in the event of a power loss with its auto-backup.

NOW LAPTOP USERS CAN 'PRINT'—WITHOUT A PRINTER To your laptop computer, PrintRite looks like a printer. Your print jobs are spooled to disk (as described above), and stored (compressed) in a DOS file. When you get to a printer, PrintRite will print the documents. And during spooling, you can operate your computer at top speed—no 'printing slow-down.' Perfect for laptop users on the go.

PrintRite's easy-to-use pull down menus allow fast, easy operation. The handy view screen (shown here) displays the printing order of your documents. From this screen, you can quickly re-arrange the order in which your jobs will be printed. PrintRite gives you more control over your printing!

PrintRite $99.95

A QUICK LOOK

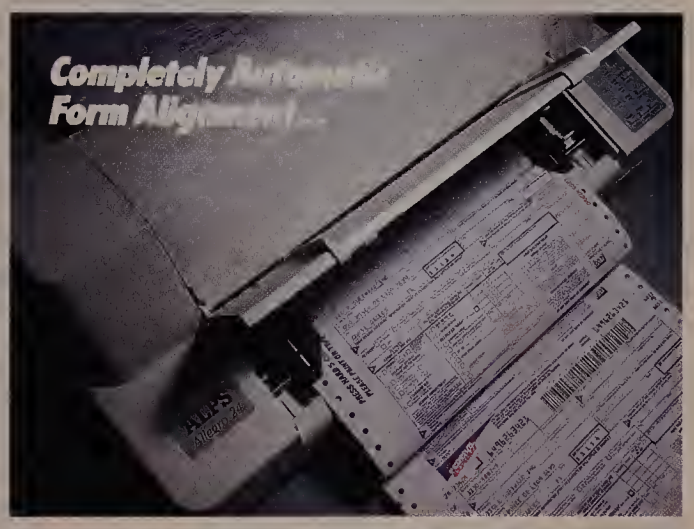
- *PrintRite is an easy-to-use utility that allows you to continue working on your computer—while printing! Laptop users who create or edit documents away from the office can store them—ready-to-print—until they get back to their printer.*
- *PrintRite is RAM-resident, allowing pop-up-anytime status checks on your print job, and requires less than 50K.*
- *PrintRite monitors all printer activity and intercepts printer output, spools it (compressed) to a DOS file. It is then added to your print queue—affording you complete control.*
- *PrintRite will add text files directly to queue—without spooling, to save time and valuable disk space. You can hold reports in queue until they're needed—and switch automatically between up to five printers. PrintRite supports LANs and printer networks, and will print up to 65,535 copies!*

PrintRite

Printer Management Toolkit From TigerSoftware

PW 4960 PrintRite IBM 5¼ AND 3½ inch.....$99.95

Runs on IBM PC, XT, AT, PS/2 and compatibles. Requires 50K memory. Will support virtually any printer.



ORDER BY 3PM (ET) TODAY, HAVE IT TOMORROW BY FEDERAL EXPRESS! CALL (800) 888-4437

A New Sense Of Freedom, Power And Control....

THE WORLD'S FIRST CORDLESS MOUSE!

Once you hold it in your hand, you'll never go back! *New Manager Mouse makes clumsy, "connected" mice obsolete! The first time you use this dynamically conceived mouse, you'll notice its smooth, effortless operation. We found working with the Manager Mouse a lot of fun—and it delivers reliable performance every time—with the speed and accuracy that only infared technology can deliver.*

Because it employs a unique "two-wheel" drive design, Manager Mouse actually ***repels dirt and foreign substances*** *that can slowly destroy traditional "ball-drive" mice. This ingenious "two-wheel" concept also provides more precise control of movement—especially helpful for delicate work. The tactile bar offers pinpoint handling, and its click has a sharp, solid feel.*

This Is One Compatible Mouse! *If your software supports traditional mice by Microsoft, Logitech and MSC, then it will run beautifully with Manager Mouse.*

Ideal for working with desktop publishing, CAD/CAM and graphics programs.

Innovative design, rugged construction. *The Manager Mouse has been engineered to (comfortably) meet the demands of heavy use.*

THE EVOLUTION OF THE MOUSE.

The challenge: design a mouse that contains state-of-the-art features and precision, make it compatible, make it fast, build it like a tank—*and get rid of that aggravating tail!*

The result is the world's first cordless mouse—The Manager Mouse. It allows faster, more accurate operation than any other mice in our comparison tests.

How does it work? Manager Mouse transfers information via a beam of infared light, emitted from its front edge and transmitted to a small receiver which can be mounted, in seconds, to your computer or monitor. Its asynchronous signal (transmits one-way) can be read *within a full 90 degree cone of this front edge.*

Why Did it Take So Long For A Cordless Mouse? Good question. First, implementing and refining infared technology.

Manager Mouse reacts so quickly, it almost anticipates your next move!

Second, was the desire to build a "better mouse." To be sure, Manager Mouse isn't just a cordless mouse, it is a new system of mechanical movement and transmission speed that provides unmatched performance for programs that were designed to support mice. The fact is, conventional mice simply cannot act as accurately or as quickly as Manager Mouse—*and they're not as much fun to use!*

The Reason Other Mice Become Slow And Inaccurate...

Mouse maintenance. A problem for users of mice with "ball-drive" engineering. Dirt is actually drawn into the mechanism by attaching itself to the soft outer surface of the ball and will eventually make its way to the internal workings of the instrument. After regular use, the mouse begins to act sluggish, tracking becomes choppy and inconsistent—needless to say, accuracy is out the window.

Not so with Manager Mouse.

The unique design of Manager Mouse's two-wheel (constructed of high quality urethane) direct drive system actually works to repel dirt and debris—for superb tracking and accuracy.

Perfectly Balanced "Positive Traction"

And manager Mouse features an advanced "positive traction" suspension system—allowing optimum use on ANY flat surface.

This new concept in suspension eliminates stress on the moving parts of the mouse.

In conventional mice, the pressure of your hand is absorbed on the ball and the surrounding rim on the underside of the mouse.

Manager Mouse is designed to diffuse the downward pressure and balance the wheels for maximum traction.

...Designed To Feel Good In Your Hand.

Graceful design in the palm of your hand. Manager Mouse has a distinctive sloped back and has solid tactile bars that eliminate fatigue and chance of error.

The Cordless Mouse $149

A QUICK LOOK

- *The world's first cordless mouse, featuring sleek operation and a balanced "feel". Offers superior performance and freedom.*
- *Unique "Two-Wheel" drive eliminates maintenance problems inherent in "ball-drive" mice. Actually pushes away dirt and debris, rather than drawing foreign substances into the housing.*
- *"Positive-traction" suspension allows Manager Mouse to be used on any flat surface—with superb control.*
- *Compatible with any software package that supports mice.*
- *(Very) easy installation.*

The Amazing New Cordless Manager Mouse

PW 8990 Manager Mouse.....$149.00

Includes infared recieving unit and detailed user guide.

FOR MORE INFORMATION, OR TO ORDER, CALL TOLL-FREE (800) 888-4437

GIVE YOUR PC XT EXPLOSIVE '386' SPEED

GIVE YOUR PC XT THE POWER OF A 386!

A BREAKTHROUGH SOFTWARE PACKAGE—MAKES YOUR PC RUN UP TO 60 TIMES FASTER!

You read that right—up to 60 times faster! *FAST! employs advanced speed enhancement techniques and brings them to a new, sophisticated level that delivers blazing speed to any program you run. And it's simple to use—just load it and go!*

A Stock IBM XT vs. A Compaq 386! *In our lab test, we matched a stock IBM PC XT, equipped with FAST!, against a stock Compaq DeskPro 386. The results were astounding—the XT outran the Compaq in a standard data transfer performance benchmark!*

FAST! $99.95

A QUICK LOOK

- *FAST! is an advanced, simple-to-use disk performance utility that employs a new concept in disk caching to achieve a dramatic increase in processing speed—in fact, your applications will run anywhere from 5 to 60 times faster! And FAST! requires no additional hardware.*
- *This method also reduces wear on your drive since continuous disk reading is virtually non-existent, your drives will last longer and run faster than you ever dreamed possible—using about 8K.*
- *FAST! is extremely easy to use, requiring just a simple installation. Its user-definable 'hot keys' will enhance performance even more.*
- *Compatibility-tested with over 650 applications.*

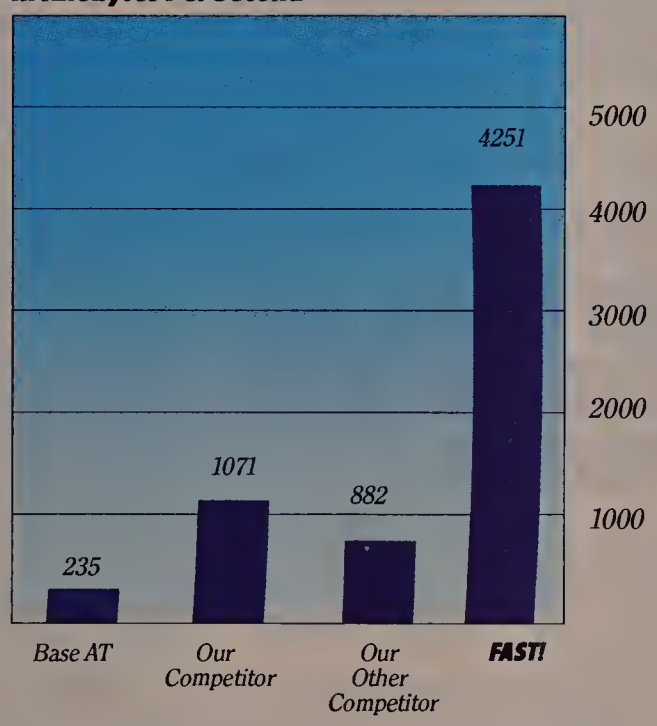
HOW IS IT POSSIBLE? FAST! incorporates the proven speed-enhancing performance of 'disk caching' and adds an innovative twist: FAST! includes a form of 'intuitive logic' that actually anticipates what data your CPU will be seeking, and reads that data from your fixed or floppy drive into a special RAM buffer (or "cache")—BEFORE the CPU asks for it!

As a result, your CPU spends virtually no time at all waiting for disk reads—an inherent logjam that slows processing time significantly.

And using FAST!, you'll notice that the more disk-intensive the application (databases, for example), the more time FAST! will save—and the faster your applications will run.

And since FAST! reduces drive read time so drastically, it also reduces wear on the disk drive—extending its life.

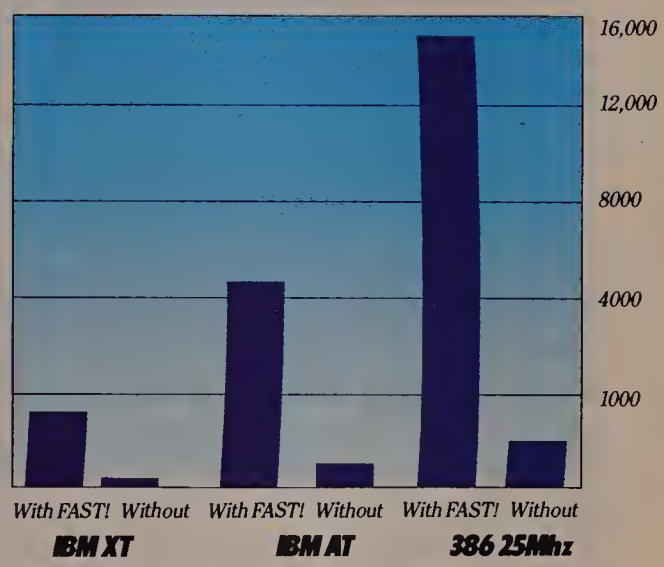
Data Transfer Rates In Kilobytes Per Second



On a standard data transfer performance test, FAST! is 18 times faster than a standard AT—and 5 times faster than the leading competitor. In fact, an IBM XT with FAST! is faster than a Compaq DeskPro 386!

With FAST! vs. Without FAST!

Data Transfer Rates In Kilobytes Per Second



FAST! Disk Performance Utility

PW 3850 FAST!—IBM 5¼ inch.....$99.95
PW 3855 FAST!—PS/2 3½ inch.....$99.95

FAST! will run on the IBM PC, XT, AT, PS/2 and compatibles with 128K RAM and DOS 2.1 or greater.

DON'T BUY MORE EQUIPMENT! You could spend thousands of dollars trying to achieve the speed required for truly efficient computing. Items like high-speed drives, turbos boards—even complete system upgrades try to overcome your system's inherent slowdown—waiting for disk reads.

FAST! is the only product that eliminates this processing tie-up and gives you top performance—using only 8K—for just $99.95

And FAST! will work with conventional, extended, or expanded RAM.

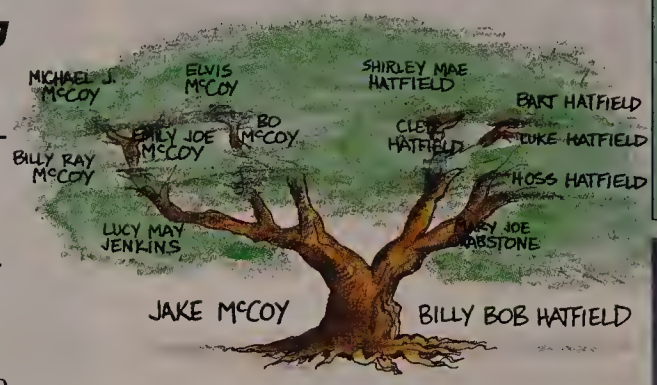
IMAGINE WHAT FAST! CAN DO FOR A 386! FAST! will deliver spectacular results on your IBM PC, XT, AT and PS/2, but imagine how much faster the "new generation" of ultra high-speed processing technology like the Compaq 386 or Intel's 386 Above Board will run using FAST!—they instantly leap into a new computing class!

In addition, FAST! supports 'hot key' controls for instant response and allows most operating parameters to be altered any time after installation—saving even more time and allowing you to be more productive.

ORDER BY 3PM (ET) TODAY, HAVE IT BY FEDERAL EXPRESS TOMORROW! (800) 888-4437

A COMPLETE GENEALOGY SYSTEM FOR YOUR PC...

ORGANIZE AND DOCUMENT YOUR FAMILY'S HISTORY AND RECORDS



Have fun constructing and updating your family tree! *Turn your home PC into a genealogy lab and provide hours of enjoyment for the entire family. FAMILY REUNION organizes all important documents and events in your family's history (birth, marriage and death certificates, descriptions of important events, etc.) and assembles a small database of the information. FAMILY REUNION then allows you to store it, display it, chart it on paper (including several "family tree" formats)—even create mailing lists and keep track of birthdays. And FAMILY REUNION lets you chart your lineage as far back as you can trace it. A captivating "research adventure" for children of all ages, and a wonderful gift for future generations.*

CHART THE LIVES OF YOUR ANCESTORS! With FAMILY REUNION, you can easily print a chart tracing your direct ancestors for up to six generations on a single page—and print your lineage as far back as you can trace it.

Prints the direct descendants of any selected ancestor in any of the following formats: direct line, descending tree, columnar or side-by-side. Print a list of your relatives which includes name and birth date—don't miss another birthday! Organize family reunions and print labels for everyone.

Family Reunion $49.95

A QUICK LOOK

- *An easy-to-use (fun) system that helps you to organize and document your family's history.*
- *Helpful in a variety of ways, FAMILY REUNION is a great gift for your descendants.*
- *Produces a host of charts and documents to create a complete genealogy system.*
- *Include notes, comments, quotes and annotations.*

Family Reunion From TigerSoftware

PW 4970 Family Reunion—IBM 5¼ inch.....$49.95
PW 4975 Family Reunion—PS/2 3½ inch.....$49.95

IBM PC, XT, AT, PS/2 and compatibles. Requires 256K.

HELPS YOU INTELLIGENTLY SELECT AND MANAGE YOUR CREDIT

CHOOSE THE SMARTEST LOAN, OR STRUCTURE EXISTING CREDIT FOR INCREASED BUYING POWER.

Ever asked questions like these? *"What is the real interest rate when I consider fees and points?" Or, "Can I pay off my 30-year mortgage in 15 years if I pay a few extra dollars each month?" "What is the effect of an extra payment?, and will early payment really save me money?" "What are my financing options?..."*

LOAN MANAGER is an easy to use tool for evaluating new credit as well as managing existing loans. Careful structuring of your loans can give you dramatically increased buying power.

POWERFUL LOAN ANALYSIS FEATURES Figure balloon payments, loan fees, points and escrow charges associated with mortgages and large loans. Helps you determine the most intelligent way to figure major financing agreements.

You can also figure any loan variable, interest rate, amount, or payment schedule—or figure for any two unknowns such as rate, term or amount (includes range-sensitive comparison tables). Standard, or "rule of 78s" calculations. Calculates amortization and payoff figures for partial or full loan term (fixed or adjustable-rate). Evaluations can be printed, sent to disk or displayed on screen.

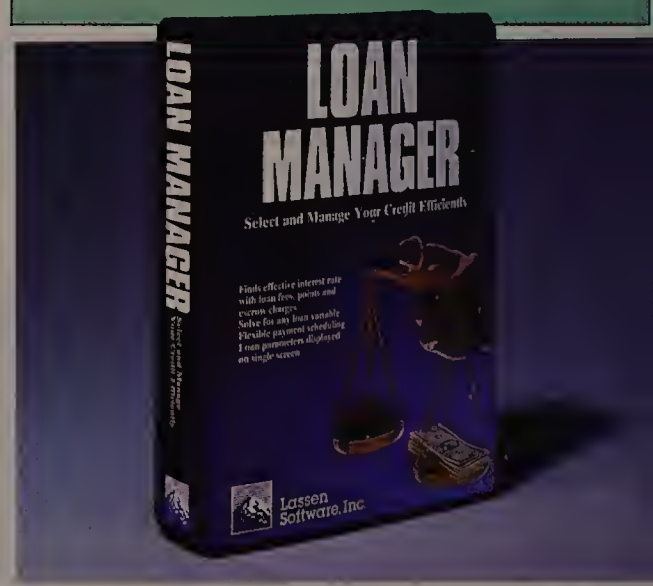
SIMPLE-TO-USE (YET POWERFUL) FEATURES LOAN MANAGER uses standard banking conventions for all calculations and contains a unique file management module for easy storage and retrieval of individual loans.

And LOAN MANAGER is easy to use; a friendly menu system streamlines operation and there are context-sensitive help screens throughout the program.

Loan Manager $49.95

A QUICK LOOK

- *Easy-to-use tool for evaluating loans and mortgages. Figures interest, fees, points, etc. Calculate and re-calculate with immediate results. Schedule loans up to $100 million and interest up to 48%.*
- *A handy tool that allows the quick "number crunching" capabilities of a spreadsheet, without constant updating of numbers and formulas.*
- *Just enter the specifics of any loan—and you'll have the answers you need.*



Loan Manager From TigerSoftware

PW 2240 Loan Manager 5¼-inch diskettes.....$49.95

Runs on the IBM PC, XT, AT, PS/2 and compatibles with 128K.

ORDER BY 3PM (ET) TODAY, HAVE IT BY 3PM TOMORROW! CALL TOLL-FREE: (800) 888-4437

CREATE BINDING LEGAL DOCUMENTS ON ANY PC!

SOFTWARE THAT 'WRITES' WILLS, LEASES, PROMISSORY NOTES, AND OTHER BINDING DOCUMENTS.

An easy-to-use, on-screen 'interview' format! *Now you can produce binding legal documents for everyday legal situations without hiring an attorney. PERSONAL LAWYER will handle:* ***General Power Of Attorney, Special Power Of Attorney, Revocation Of Power Of Attorney, Statement Of Child Guardianship, Residential Real Estate lease, Promissory Note*** *and* ***Personal Wills.***

PERSONAL LAWYER works by asking you a set of questions related to your specific situation. The program will then ask subsequent questions, to follow-up, based on your original responses. Once the complete set of questions has been answered, PERSONAL LAWYER will compile the information, select paragraphs from a predetermined set within the system, and actually "write" an enforceable document for the circumstances you've described using its unique "text-builder".

This program has been developed under the supervision of attorney Douglas B. Jacobs, and the documents produced are legally binding. You could save thousands of dollars in legal fees by preparing documents yourself quickly, easily—and inexpensively—with PERSONAL LAWYER.

[The PERSONAL LAWYER meets the requirements of 49 states and the District of Columbia—the state of Louisiana is excluded because much of its legal system is based on French rather than English law.]

Personal Lawyer $59.95

A QUICK LOOK

- *Fast, easy-to-use system that allows you to produce binding documents for everyday legal situations.*
- *Handy tool for quickly updating your will, lending money, leaving your child in the care of others—even producing a residential lease.*
- *Just type answers to questions asked by the system and the document is written for you.*

LAST WILL AND TESTAMENT. The importance of a personal will cannot be overstated and there are many reasons for having a will in today's society.

Without some careful thought to the distribution of your estate, it is possible that it might escheat (default) to the State or Federal Government, resulting in higher taxes and/or fees than necessary.

Personal Lawyer permits you to bequeath general or special gifts. It also enables you to specify the executor of your estate, choose a guardian or guardians to care for minor children and make many other decisions for competent estate planning.

PROMISSORY NOTE Promissory notes provide the written ability to agree to accept a loan on certain terms and to define the payback of the loan. Create notes with or without interest, with or without balloon payments, or even simple notes payable on demand.

POWER OF ATTORNEY Power of attorney documents give you the power to take care of your assets, either generally, or for specific matters. You also can create a revocation of power of attorney.

STATEMENT OF GUARDIANSHIP A Statement of Guardianship is used to appoint someone to handle the personal rights of your children in a temporary situation. Give a neighbor or friend discretion to care for your children in your absence.

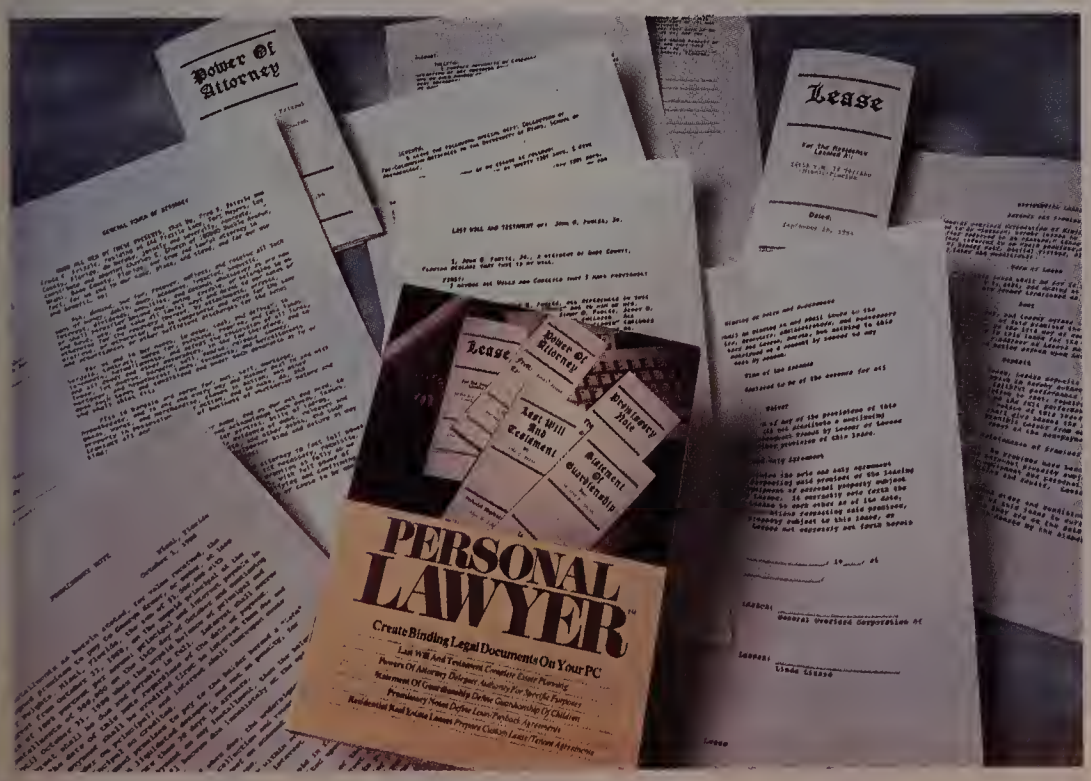
Such a document is often useful to give your child's teacher or school the requisite authority to take the child on field trips and class outings.

RESIDENTIAL REAL ESTATE LEASE This portion of the program allows you to easily write a legally binding lease for such residential property as a house, duplex, apartment or rental condominium.

If you have real property to rent as a residence, or you are a renter of such property, you need the protection of a **written lease.** There are two major reasons to put such agreements in writing.

First, a long-term lease for real property is not legally enforceable in many instances unless it is in writing. Second, there exists no better method to formalize your agreement so that both the landlord and tenant are clearly able to read and understand all of the specific rights, duties and obligations that they have undertaken in the rental of the property.

Create a lease that covers such items as: security deposits, pets, payment of utilities, parking, etc.



Personal Lawyer
From Tiger Software

PW 2250 Personal Lawyer 5¼ Diskettes $59.95
PW 2255 Personal Lawyer 3½ Diskettes.....$59.95

Requires minimum 256K RAM. Supports color or monochrome and fully supports virtually ALL printers.

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Put Images Of Tomorrow In Your Home Or Office—Today...

Images Of Unbelievable Depth, Color, Clarity And Vibrance...

FREE SHIPPING! FEDERAL EXPRESS VIA FEDERAL EXPRESS! Call By 3PM Today, Have Your Order Tomorrow (800) 88-TIGER

Computer technology has begun to offer the world the ability to think in the third dimension—Computer Aided Design (CAD) systems produce images with precision and depth. Three-dimensional spreadsheets allow users to see not only rows and columns of data, but *layers* as well.

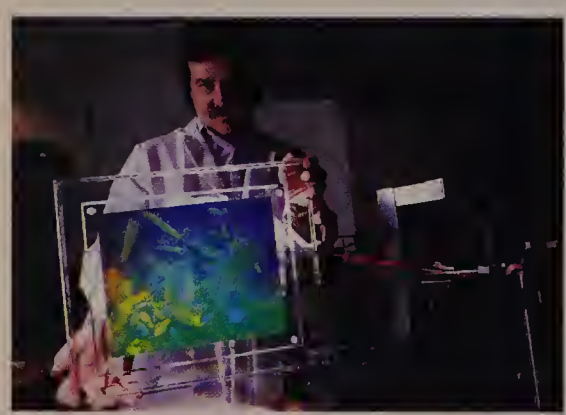
This added dimension provides an entirely new view of ideas, patterns and objects.

Recent breakthroughs in laser technology will eventually lead to *holographic* displays and printers. Images like those appearing on this page will be displayed on your screen—printed in true three-dimension—even transmitted via fiber optics anywhere in the world.

Today, a select group of holographers are uniting these advanced laser techniques with various artforms—to produce a new level of artistic expression.

These images are reproduced onto ultra-high quality optical film, with resolution of 175,000 lines per inch—as compared to today's high-end workstations with screen resolutions of 8000 lines per inch).

A rare process of combining the Red Krypton laser's *reference* and *object* beams allows holographers to produce breathtaking multicolor images.



Holographer Larry Lieberman displays one of his incredible images now available through Tiger.

A Canvas Of A Different Sort.

The mystery and wonder of the third dimension has captured the imagination of artists around the world. Painters, sculptors, graphic designers, model builders and abstract artists have flocked to holography in search of a more powerful medium of expression. They've extended the limits of their respective crafts by achieving endless depth, previously inimagineable perspective and a new vista of color and hue.

The unique blending of holographic craftsmen and skilled artists renders images that bring a relaxing, holistic aura to any environment. You'll feel the movement, color and depth reacting in perfect harmony.

The result of their work is now available to TigerSoftware customers for exhibit in your home or office.

The images include a 15 by 18-inch lucite frame, assembled by hand and make a facinating addition to any collection, or a wonderful gift.

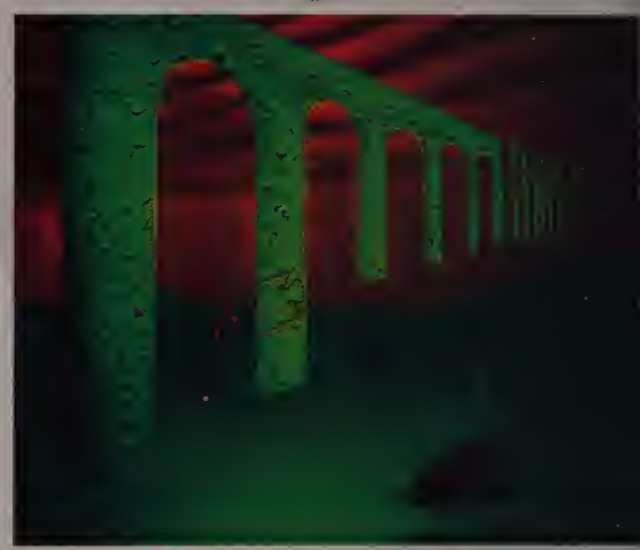
Limited Edition Holographic Images.

Each image is signed by the artist and individually numbered. Since this early collection will consist of just 2000 reproductions, each is certain to increase in value.

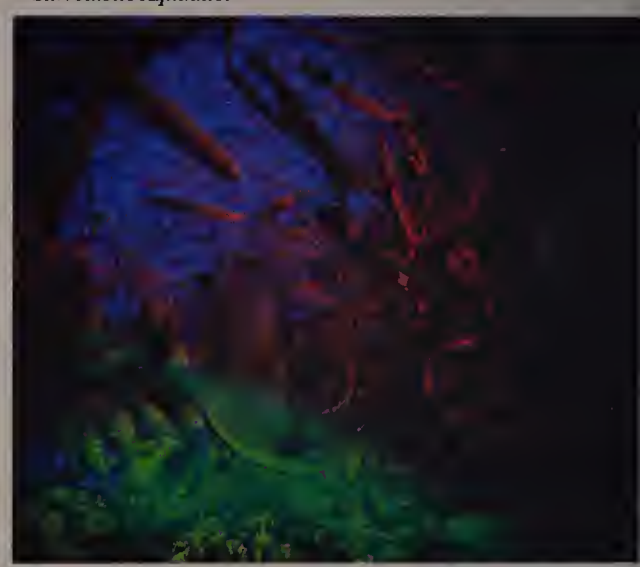
PW 5000 "Shells".....$249.95
PW 7000 "Surrealistic Aquaduct".....$249.95
PW 7050 "The Aquarium".....$249.95
PW 8000 "Abstract Light".....$249.00

Includes instructions on care and proper display. YOU WON'T BELIEVE YOUR EYES! These images, handsomely framed in lucite, bring an intriguing aura to any environment.

"Abstract Light"



"Surrealstic Aquaduct"



"Shells"

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Use All Existing Files When You Change Word Processors...

Quickly Convert Files Between Word Processor Formats!

Now those indispensible WordStar files you created six months ago can be easily converted to the WordPerfect format you're running now. WORD FOR WORD is ideal for exchanging files of different formats with business associates, customers, friends—you can even convert files created on your home or laptop computer to the format used in your office—with absolutely all of the formatting commands (like bold, underline, centering, tabs, etc.)—intact!

WORD FOR WORD is fastest! It can convert a 25-page document in less than one minute—600% faster than the competition!

WORD FOR WORD supports floppy or fixed disk drives, and is completely menu-driven for fast, smooth operation.

Allows Lotus 1-2-3 Coversion INTO Your Word Processor!

WORD FOR WORD allows you to convert spreadsheet files into your word processing format! And no other product allows you to perform conversions between "integrated" packages like Enable, Framework, Q&A and pfs: First Choice.

Converts Government Standard Word Processor Formats.

Supports Navy DIF, Peachtext and Enable, RapidFile and WANG PC.

WORD FOR WORD is the fastest conversion software we tested. A 25-page, fully formatted document can be converted in less than one minute!—with all attributes intact.

Converts ALL Attributes! ...contained in the original: margins, tabs, indents, soft and hard carriage returns, boldface, italics, underlines, superscripts/subscripts, newspaper columns, headers, footers, centering, footnote formats, ruler lines, page ends—and dozens more!

Word For Word From TigerSoftware

PW 1320 WORD FOR WORD IBM 5¼-inch.....$99.00
PW 1325 WORD FOR WORD 3½-inch.....$99.00

IBM PC, XT, AT and compatibles with 256K RAM.

CONVERT IN EITHER DIRECTION BETWEEN ANY OF THE WORD PROCESSING FORMATS LISTED BELOW:

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WordPerfect 5.0
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OfficeWriter 6.1
pfs: Professional Write 2.1
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MultiMate
IBM Writing Asst.
Microsoft Word 5.0
"Smart" ASCII
"Stripped" ASCII
EBCDIC
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WANG PC

Also Allows Conversions Between These Integrated Packages:

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TigerSoftware

800 Douglas Entrance, Executive Tower, 7th Floor, Coral Gables, FL 33134

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Month **Year**

Expiration Date

Check or money order number

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The RAM Management Department

You Can Use RAM-Resident Programs Again!

Remove And Replace RAM-Resident Programs Without Re-Booting!

PopDrop manages your RAM-resident programs!

PC users employ a slew of RAM-resident programs—spell checkers, thesauri, keyboard macro programs, print spoolers, desktop organizers, notepads, calculators and more. These "pop-up" programs provide convenience and enhance productivity.

*The problem with these programs is managing them. Some create memory or keyboard conflicts and therefore can't be loaded with others, while some gobble up so much memory that you can't use anything else. POP DROP solves these aggravating problems by allowing you to actually remove, replace, even deactivate RAM-resident programs—**without rebooting your system!** POP DROP is and excellent tool for making different programs resident when you switch to another program that may not accept them. POPDROP won't interfere with other programs including backup programs.*

*Voted one of "The Best Of The Best Utilities" by **PC Magazine,** POP DROP is one program you shouldn't be without. Reasonably priced, 100 percent reliable and **very** easy to use.*

Avoid RAM-Resident Conflicts Forever!

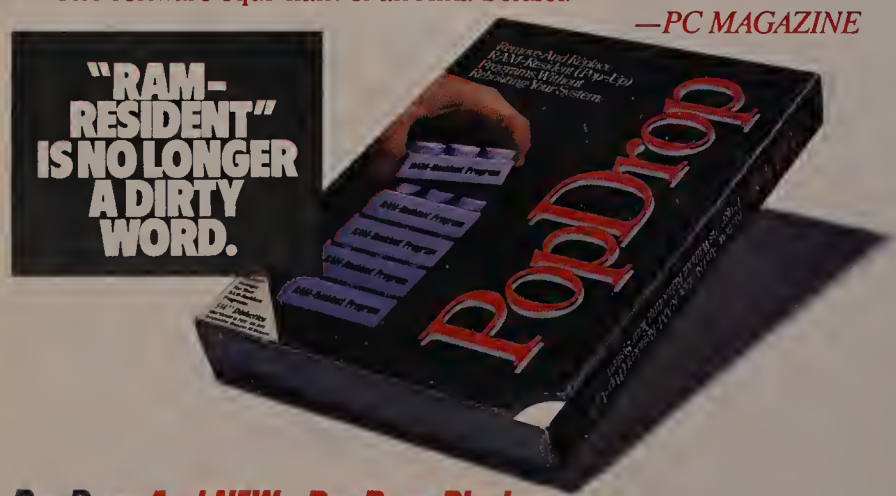
PopDrop works by dividing your memory into layers—**up to 16**—each of which may contain several progams. After loading DOS and your permanent programs, RAM-resident programs are loaded with these layers between them, the most permanent at the bottom, the least permanent at the top. You can create batch files to remove layers one at a time, or several at once.

You can clear all memory or all layers with one command, freeing up the RAM those programs required—it couldn't be easier.

The Key is Flexibility...

Here's an example: if you want to run a RAM disk, a print spooler and one or more pop-up programs most of the time, but need them out of the way to work on a large spreadsheet, you can do it easily with Pop Drop. If you need different programs resident when you switch to another application—it's no problem. In fact, you can use Pop Drop in your menu program or batch files to make this automatic. Other products gobble up 25 to 40K, PopDrop gives you more power and flexibility—and occupies just 1K!

"The software equivilant of an Alka-Seltzer."
—*PC MAGAZINE*



PopDrop And NEW—PopDrop Plus!

PW 2130 PopDrop PC-5¼ inch diskettes	$49.95
PW 2140 PopDrop PS/2-3½ inch diskettes	$49.95
PW 2150 PopDrop PLUS PC-5¼ inch	$99.95
PW 2155 PopDrop PLUS 3½ inch	$99.95

...A Technological Breakthrough!

Or—Load All Of Your RAM-Resident Programs Into EXPANDED Memory!

NEW! PopDrop Plus—with PopLoad.

The Ingenious Solution To Notorious "RAM-Cram."

*PopDrop PLUS allows you to load TSRs—up to 50—into your **expanded memory**—even though they only support conventional memory! This unique product takes just 27K of conventional memory and allows your lower 640K to be used exclusively for larger applications like Lotus 1-2-3, WordPerfect, dBASE IV, etc.*

*The fact is, these programs are **larger** and more complex than their predecessors. Without PopDrop Plus, TSRs can become a nightmare—error messages, rebooting, program juggling—it's gotten so bad, most users have simply stopped using TSRs.*

*PopDrop Plus is compatible with desktop utilities such as **SideKick, WordFinder, ProKey, SuperKey** and **Turbo Lightning**.*

PopDrop Plus—Uses Just 27K!

PopDrop PLUS will allow you to load up to 50 different TSRs into expanded memory at a time from its defined list. To use one of the loaded TSRs, just use its normal hot key to make it active, or select it from PopDrop's menu. If the TSR you need isn't loaded, you can quickly load it in a different list of TSRs.

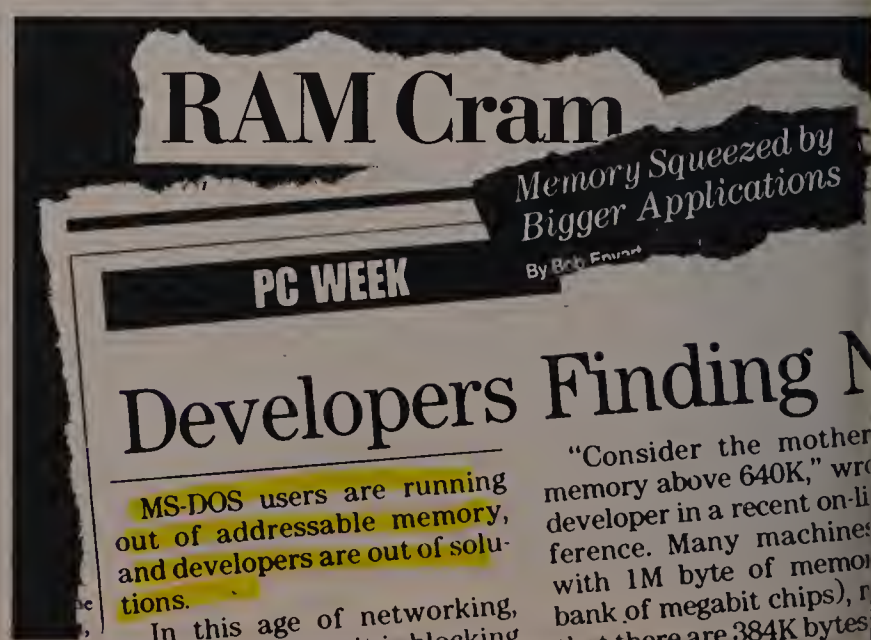
Compatible With Most TSRs.

Virtually any TSR you use can be quickly loaded into expanded memory using PopDrop Plus. True LIM EMS 4.0 hardware is required.

It is ideal for users connected by networks that require RAM to hook into their PC. No other product—hardware or software—allows the fast, easy utilization of expanded memory for TSRs like PopDrop Plus.

On Its Way To Becoming The Year's Best New Product!

An amazing fact: some large corporations have NOT upgraded their current word processing, spreadsheet, database and network software because it would consume so much memory that they couldn't use their necessary TSRs. They simply had no choice. PopDrop Plus is the answer. Now, these major applications run smoothly in conventional memory without having to "tiptoe through the TSRs." Your TSRs are tucked safely out of the way in expanded memory—ready to pop-up at any time.


RAM Cram
Memory Squeezed by Bigger Applications
PC WEEK
Developers Finding N
MS-DOS users are running out of addressable memory, and developers are out of solutions.
In this age of networking,
"Consider the mother memory above 640K," wr developer in a recent on-li ference. Many machines with 1M byte of memo bank of megabit chips), r there are 384K bytes

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The *PC World* see-through solar calculator can be yours FREE, just for subscribing to *PC World*. Your special gift features:

- Amazing crystal-clear body with invisible circuitry
- Credit card size convenience
- Multi-function memory
- Special function keys: square roots, automatic percentages, etc.
- Easy-to-read liquid crystal display
- Advanced solar panel cell—it never needs batteries!

YES! Rush me my FREE GIFT and enter my one year subscription (12 monthly issues) to *PC World* for only $19.97. That's almost 44% off the annual cover price and over 33% off the regular subscription rate of $29.90.

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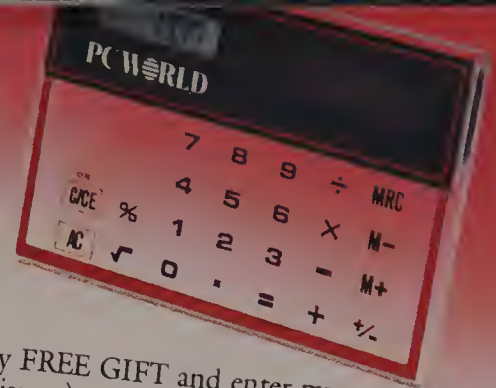

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THE READERS' CHOICE

1989 WORLD CLASS AWARDS

PC WORLD READERS VOTE FOR THEIR FAVORITE HARDWARE AND SOFTWARE—AND TALK ABOUT WHAT THEY LIKE, HATE, AND WOULD CHANGE IN THE WINNING PRODUCTS.

Welcome to *PC World*'s seventh annual World Class contest—the only industrywide contest that asks *readers* to vote for their favorite hardware and software products. Instead of gathering together some latter-day silicon sages and asking for their trenchant picks, *PC World* hands the ballot to its half-million readers and says "Fire away!" And fire away you did. Nearly twice as many ballots were mailed back this year than last—testament, we think, not only to our $48,000 in prizes but also to readers' growing consumer awareness. The results are tabulated on the following pages.

As we've sifted through World Class votes over the years, we've naturally tried to decipher the mysterious market forces that rocket a *1-2-3* to software stardom and relegate a *Visi-On* to obscurity. But second-guessing the computer industry is a little like trying to thread a needle on a roller coaster.

This year we've gone straight to the World Class voters and asked why certain products made the grade while others didn't. What follows isn't a scientific survey complete with *n*th name sampling, but merely a personal poll of some of the people who bought, used, and voted for the products that grabbed World Class honors. You may not be able to graph the results, but the reactions are more telling than any market research report.

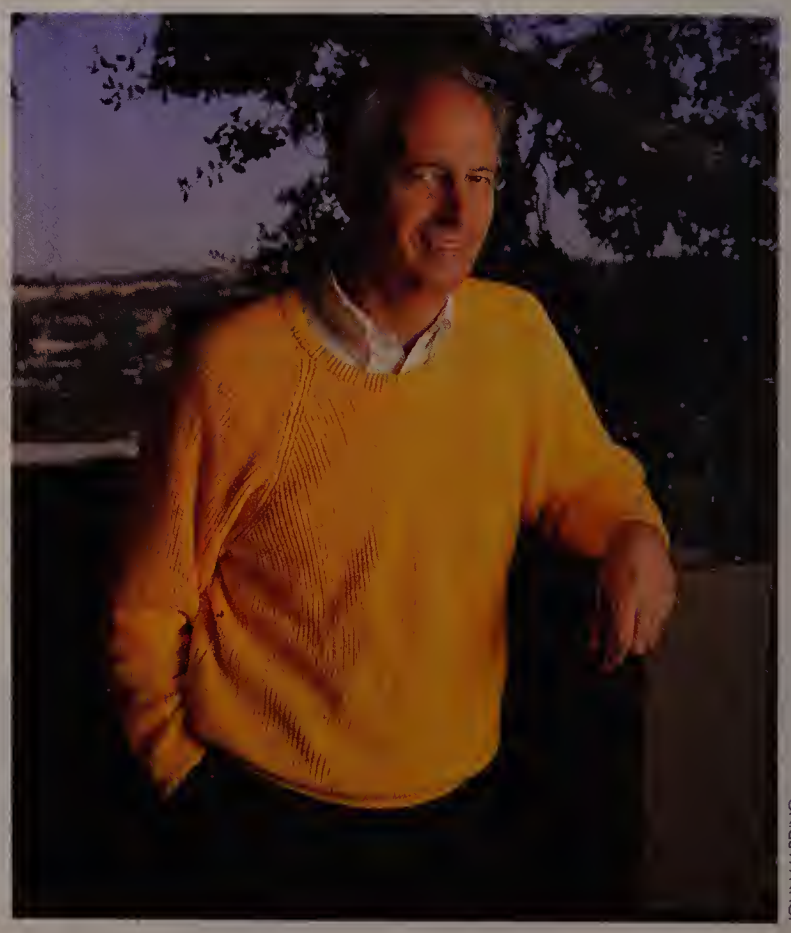
The Fundamental Things Apply

As World Class voters talked about what they liked, hated, and would change about the winning products,

Robert Luhn

"Vendor support is a must if the product is really complex."

—Ron Ogg, computer consultant



JOHN HARDING

KEVIN HORAN

"We want simple software that new users can grasp right away."

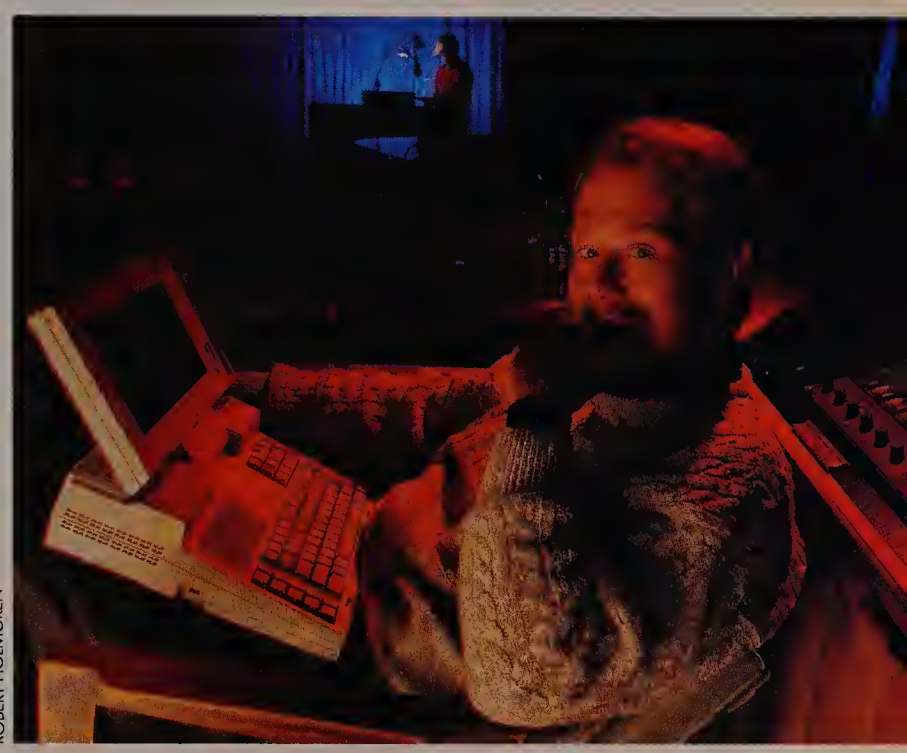
—Doug Grohne, director of computing, Western Illinois University

"WordPerfect's support is exceptional—and that makes me a fan."

—Gary Bridges, television producer

they returned again and again to three basic virtues: reliability, simplicity, and comprehensive vendor support. Powerful features don't top wish lists. When pressed to pick the most important factor, most readers point to technical support.

"It makes or breaks a product," says Gary Bridges, a television sports producer in Philadelphia who's often on the road. "*WordPerfect*'s support is exceptional—and *that* makes me a fan." Vendor support is especially crucial if a company's information center can't handle a product. "It's a must if the product is really complex," says Ron Ogg, a computer consultant in Orinda, California. "Microsoft's support for *Windows* has been outstanding. They'll research a problem and call you back with an answer."



ROBERT HOLMGREN

BOB WAGNER

"Procomm offers more bang for the buck, bar none. And it doesn't require a training program."

—Peter Gambitsky, plant engineer

ALL-TIME WORLD CLASS CHAMPS

Products that have taken first place seven years in a row

1-2-3
Flight Simulator
Microsoft Mouse
dBASE
Smartmodem

Of course, getting womb-to-tomb technical support usually means buying an expensive mainstream product from a WordPerfect or a Compaq. But if an easy-to-use product doesn't need much support in the first place—and it fits more comfortably into a tight budget—customers will line up with dollars in hand. So say both small-business owners and Fortune 500 managers, who told us they use and would unhesitatingly recommend shareware and former shareware programs such as *PC-Write* and *Procomm Plus*. If a program strikes that delicate balance between power and simplicity, users don't care where it comes from.

Raves and Reservations

Breaking open new hardware and software categories, however, is still the job of PC dreadnoughts with big R&D guns. But innovation isn't always fully appreciated. "Lotus should be shot for releasing *Agenda* too soon," says one reader. "But they should also be commended—it's a hell of an idea!"

Paying for half-baked software isn't the only reader gripe we heard: A common complaint is that small companies are shut out of site-licensing deals. It's easy to vote for a big-name package like *1-2-3*, small firms say, but hard to get a site license if your company lacks a Fortune 500 budget. "Software publishers practically promote software piracy," says Leslie Manley, a computer services administrator for a Southern California telecommunications company. "You have to buy 1000 copies to get site-license rates. It's hard for a small company to stay legal."

In spite of the gripes, most of the readers we polled cast more bouquets than brickbats. What follows is a representative smattering of their thoughts.

WORDPERFECT

"I'd vote for it again, absolutely. *WordPerfect 5.0* is all I need to produce real good-looking manuals. I don't need *Ventura Publisher*. The more I use it, the more I like it—something I couldn't say about *R:base*, for example." *Craig Huggert, documentation specialist*

"I started out with *WordStar*, but *WordStar* is dead. *WordPerfect* is much friendlier, more flexible, and much better supported. In Canada you can get a Québecois version or one that lets you edit English and French documents side by side." *Michael Mull, information center manager*

"*5.0* is better than the old versions—but it doesn't support as many printers! That's a pain, but I wouldn't part with it." *Lee Kent, newspaper editor*

"If I was a legal secretary, I'd demand *WordPerfect*." *Douglas Shipe, financial consultant*

"You're really spending a lot of money for features you'll never use. If I could find an integrated package like *Enable* that imports all the file formats I use, I'd throw all the software on my shelf away." *Isiah Robinson, medical technician, U.S. Navy*

"We got *5.0* because it imports graphics and we're getting into desktop publishing. But we're still using *4.2*—*5.0* is so humongous that it won't run on a dual-floppy PC, and it takes up so much RAM that it won't run on the network.

"Don't talk to me about *WordPerfect* support! They've got an 800 line, but you need an auto-dialer working 3 hours to get through. Besides, no tech support group is good at helping new users—they're speaking Greek to them. Most of our support comes through user groups." *Doug Grohne, director of computing, Western Illinois University*

"I don't have a wish list for *5.0*—I'm absolutely satisfied." *Joseph Feltzer, real estate appraiser*

PROCOMM PLUS

"*Procomm* offers more bang for the buck, bar none. And *Procomm* doesn't require a training program. But my company uses *Crosstalk*, which is the pits. And *Smartcom III?* Who needs 3MB on your hard disk? It's overkill." *Peter Gambitsky, plant engineer, New York Telephone*

"With budgets getting trimmed, products like *Procomm* are very attractive. It's so simple, it can be easily supported by our information center." *Michael Mull*

"My university buys software because of the name, but it ends up collecting dust on the shelf. We want simple software that new users can grasp right away. *Procomm* is easy to use and learn." *Doug Grohne*

DBASE IV

"I didn't find *dBASE IV* hard to use at all. If people are having problems, they're just not reading the manual." *William Walker, CNN overnight anchor*

"I'd prefer a built-in compiler à la *QuickBASIC*, but I don't expect Ashton-Tate to ever provide one. They're not interested in developers. If you need something extra, you have to go elsewhere." *S. D. Connelly, hardware designer*

"Business users don't have time to learn code. The *dBASE* dot prompt was useless! That's why *dBASE IV* will catch on, because it's so much friendlier. Besides, where can you find a *Paradox* programmer when things go wrong?" *Douglas Shipe*

"Contrary to the rumors, *dBASE IV* is easy to pick up and use. I was drawn to it because I had a deadline to meet and I could start using it right away. I'd vote for it again—in spite of the bugs." *Doug Grohne*

"Why not upgrade? It was $30 a pop, and the pseudo-compiler was worth it. We use it for speeding up a lot of small applications we'd never compile with *Clipper*. I can live without *WordPerfect* but not *dBASE*." *Peter Gambitsky*

EPSON LQ-2550

"We really had to think hard about *why* we should buy a dot matrix printer. People working with wide spreadsheets or doing print screens use the LQ-2550. But if they're outputting text or graphics, they use the LaserJet. Next year I'd vote for a *cheap* PostScript printer." *Craig Huggert*

"It's like an old Chevy: reliable, easy to service, widely

WORLD CLASS WINNERS

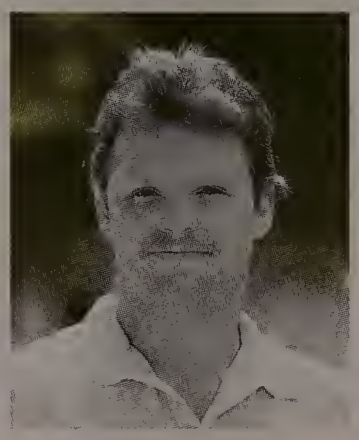
Every year *PC World* asks readers to vote for their favorite hardware and software products. We pluck three ballots at random from the thousands received and award first-, second-, and third-place prizes to three lucky readers. Third prize is the favored laptop computer; second prize is the top transportable computer. The first-place winner gets a king's ransom: the winning desktop computer, the remaining voter-pleasing hardware (from laser printer to modem), and the entire cadre of World Class software.

THE WINNERS:

ROBB KENDRICK

Vic Cherubini, First Place

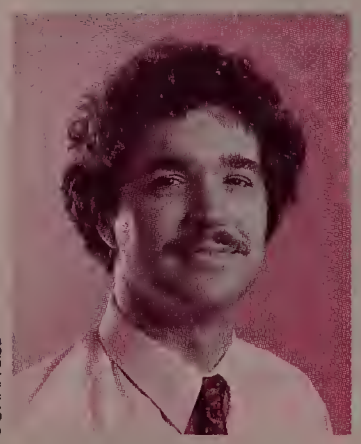
Vic Cherubini got his first taste of personal computing in 1984 with a Radio Shack computer. Once bitten, Cherubini became "not exactly a nerd—let's just say I'm computer serious." He joined the booming Houston Area League user group, bought a Corona portable, and was on his way. An MBA and national sales manager for Canusa Ltd., a pipeline coating firm in Woodlands, Texas, Cherubini uses XT and AT clones in his sales office and an AT compatible at home. But the arrival of a World Class Compaq Deskpro 386/25 has set him thinking. "We have a large mailing list data base on an 8086 machine, and I get awfully tired of watching that little light flash." A new Deskpro 386 could speed that chore considerably.



JOE TRAVER

John Richter, Second Place

John Richter is a computer enthusiast—and then some. "I built my first computer for my eighth-grade science fair. It wasn't solid state—it had light bulbs instead of LEDs—but it worked. And it won first prize!" Richter became an electrician and currently is a foreman for Weydman Electric in Buffalo. Unlike most *PC World* readers, Richter doesn't own a PC. "Right now I use a Commodore 128 to print out manpower stats on an 800-unit renovation we're doing, which sure impresses my boss." Why read *PC World* at this point? "The guys kid me, but I wanted to be ready when I bought my first PC."



DONNA BISE

Norman Beasley, Third Place

In Norman Beasley's line of work, keeping in touch is vital. He's a missionary and construction technician for Wycliffe Bible Translators, an organization that works with missions throughout South America. The group normally communicates with its tribal linguists via radio, but "computers are coming more and more to the fore," says Beasley. Both Beasley and his wife are "missionary kids" and will probably take their next overseas jaunt—Compaq SLT/286 in hand—in 1990. —*R. L.*

WORLD CLASS WINNERS THAT TIME FORGOT

Famous products that took first place and never returned

Product	Last Seen
VisiFile	1983
Keynote	1983
PCjr	1985
Tax Preparer	1985
TopView	1985
ThinkTank	1986
HAL	1987

distributed. It's a workhorse. But it's yesterday's technology. I'm a LaserJet man all the way." *Douglas Shipe*

ALLWAYS

"I needed to print my worksheets out on one piece of paper. *Allways* did the job. Now if it could just output slides or transparencies..." *Isiah Robinson*

COMPAQ SLT/286

"At last, a real Compaq laptop with a screen you can read! The SLT lives up to its specs, too; we had to replace the batteries in Toshibas all the time, but not in the SLTs. Our wish list: a 386 version with a color display. Oh yes—an 80MB hard disk would be nice." *Frank Whitney, hardware and software analyst*

"I don't have it, but I'm lusting after it. It would be perfect for doing library research." *William Walker*

AGENDA

"*Agenda* is the perfect place to dump uncollated information. But it's not very intuitive; if you don't use it for a couple of weeks, you forget how. Getting printed output is also a pain. Lotus spent millions reinventing its printer drivers—badly." *Gary Bridges, producer, Olympia Broadcasting*

"*Agenda* is wonderful and lets me do things that I couldn't do before. But it's not a finished product. It'll be a revolution—someday." *Tom Atwater, accountant*

"Why vote for *Agenda?* Personal information managers are the hot new software category. Lotus doesn't have the programming genius, but they have the marketing genius, and they can educate a lot of people." *Craig Huggert*

ADVANCED NETWARE

"Most LANs are a headache, but *NetWare* is easy to use, and we've had few problems. That's a surprise, since a lot of our students *try* to crash the network for fun. But they haven't had any luck." *Doug Grohne*

"*NetWare* presented the fewest problems. I was developing a network personnel program for the Canadian government with *Clipper.* We tried 3Com and had file-locking problems and a lot of downtime. *NetWare* solved those problems." *Michael Mull*

VENTURA PUBLISHER

"Thank goodness for all the *Ventura* books on the market—you can never get through to Xerox's tech support! And when you do, they refer you to the dealer, who doesn't know much." *Ron Ogg, computer consultant*

"Learning *Ventura* right takes a lot of time...but you can do something right away. The style sheets are a big plus. But it needs an on-line tutorial and easily used DOS-like utilities. Copying files or assembling an entire publication in one place is a major pain." *Leslie Manley, computer services system administrator, Telcom Technologies*

HARVARD GRAPHICS

"I'm sold on it because I don't have to support it. People won't be calling me about problems, because it's simple to use. And if I can eliminate two phone calls a day, I'm ahead of the game." *Frank Whitney* ●

Robert Luhn is a senior editor for PC World.

For more information about all products in this article, circle reader service no. 904.

WORLD CLASS THROUGH THE AGES

Year	Total prize value	Software/ hardware categories	First-place system
1983	$14,000	14	IBM PC
1984	$23,000	29	IBM PC
1985	$36,000	38	IBM PC AT
1986	$37,000	39	IBM PC AT
1987	$40,000	42	Compaq Deskpro 386/16
1988	$55,000	35	Compaq Deskpro 386/20
1989	$48,000	35	Compaq Deskpro 386/25

HARDWARE

DESKTOP COMPUTER

%	Product	Manufacturer
22	**Compaq Deskpro 386/25**	**Compaq Computer**
7	IBM PS/2 Model 70-A21	IBM
6	Dell System 325	Dell Computer Corp.
5	IBM PS/2 Model 80	IBM
4	IBM PS/2 Model 50Z	IBM
56	Others	

78% of the respondents voted in this category

TRANSPORTABLE COMPUTER

%	Product	Manufacturer
32	**Compaq Portable 386**	**Compaq Computer**
15	Compaq Portable III	Compaq Computer
7	Compaq SLT/286	Compaq Computer
7	NEC ProSpeed 80386	NEC Home Electronics
4	Toshiba T5200	Toshiba
4	Toshiba T5100	Toshiba
31	Others	

34% of the respondents voted in this category

LAPTOP COMPUTER

%	Product	Manufacturer
13	**Compaq SLT/286**	**Compaq Computer**
11	SupersPort 286	Zenith Data Systems
10	Toshiba T5100	Toshiba
9	NEC UltraLite	NEC Home Electronics
6	NEC ProSpeed 80386	NEC Home Electronics
51	Others	

48% of the respondents voted in this category

DOT MATRIX/NLQ PRINTER

%	Product	Manufacturer
10	**Epson LQ-2550**	**Epson America**
7	Epson LQ-1050	Epson America
6	Epson LQ-850	Epson America
5	Panasonic KX-P1124	Panasonic
3	Panasonic KX-P1091	Panasonic
3	Epson FX-1050	Epson America
66	Others	

68% of the respondents voted in this category

MONITOR

%	Product	Manufacturer
24	**NEC MultiSync II**	**NEC Home Electronics**
8	Zenith ZCM-1490	Zenith Data Systems
7	NEC MultiSync 3D	NEC Home Electronics
6	NEC MultiSync 2A	NEC Home Electronics
5	NEC MultiSync Plus	NEC Home Electronics
50	Others	

57% of the respondents voted in this category

LASER PRINTER

%	Product	Manufacturer
52	**HP LaserJet Series II**	**Hewlett-Packard**
19	HP LaserJet Series IID	Hewlett-Packard
5	NEC Silentwriter LC890	NEC Information Systems
3	Apple LaserWriter IINTX	Apple Computer
3	Panasonic KX-P4450	Panasonic
18	Others	

55% of the respondents voted in this category

MODEM

%	Product	Manufacturer
22	**Smartmodem 2400**	**Hayes Microcomputer Products**
11	Smartmodem 2400B	Hayes Microcomputer Products
7	V-series Smartmodem 9600	Hayes Microcomputer Products
4	Smartmodem 1200	Hayes Microcomputer Products
4	Courier HST 9600	U.S. Robotics
4	Smartmodem 9600	Hayes Microcomputer Products
48	Others	

41% of the respondents voted in this category

INPUT DEVICE

%	Product	Manufacturer
40	**Microsoft Mouse**	**Microsoft**
13	Logitech C7 Mouse	Logitech
11	Logitech HiRez Mouse	Logitech
4	HP ScanJet	Hewlett-Packard
3	ScanMan	Logitech
3	OmniKey/102 keyboard	Northgate Computer Systems
26	Others	

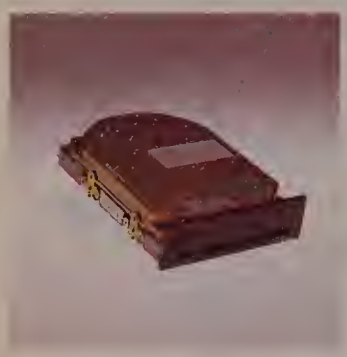
33% of the respondents voted in this category

GRAPHICS BOARD

%	Product	Manufacturer
8	**VGA Wonder**	**ATI Technologies***
8	VGA Professional	Paradise Systems
8	Vega VGA	Video Seven
7	FastWrite VGA	Video Seven
6	VGA Plus	Paradise Systems
63	Others	

32% of the respondents voted in this category

** Percentages rounded; product received largest number of votes.*



MASS STORAGE

%	Product	Manufacturer
15	**Seagate ST251**	**Seagate Technology**
10	Seagate ST4096	Seagate Technalagy
8	Hardcard 40	Plus Develapment
5	Passport 40	Plus Development
4	Seagate ST225	Seagate Technolagy
58	Others	

26% of the respondents voted in this category

MEMORY EXPANSION BOARD

%	Product	Manufacturer
21	**AboveBoard Plus**	**Intel**
11	AboveBaard 286	Intel
7	Rampage Plus 286	AST Research
7	Rampage 286	AST Reseorch
6	SixPakPlus	AST Research
4	Rampage	AST Research
44	Others	

22% of the respondents voted in this category

LOCAL AREA NETWORK—NETWORK BOARD

%	Product	Manufacturer
12	**Token-Ring**	**IBM**
10	Etherlink baards	3Com
8	Arcnet baards	various
3	LANtastic	Artisoft
3	TOPS Flashcard	Sun Microsystems
64	Others	

13% of the respondents voted in this category

MOST PROMISING NEWCOMER—HARDWARE

%	Product	Manufacturer
7	**UltraLite**	**NEC Home Electronics**
3	Connectian Caprocessor	Intel
3	Next Camputer	Next
3	ScanMan	Lagitech
3	Campaq SLT/286	Campaq Computer
81	Others	

23% of the respondents voted in this category

SOFTWARE

WORD PROCESSING

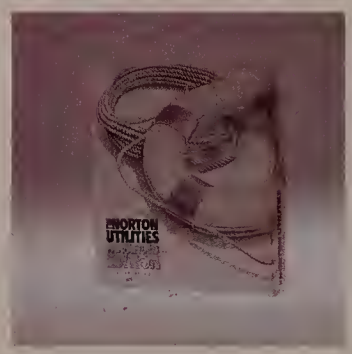
%	Product	Manufacturer
49	**WordPerfect**	**WordPerfect**
15	Microsaft Ward	Microsoft
7	WordStar Professianal	WordStar Int'l
5	Professianal Write	Software Publishing
3	MultiMate Advantage II	Ashton-Tate
21	Others	

85% of the respondents voted in this category

SPREADSHEET

%	Product	Manufacturer
45	**1-2-3**	**Lotus Development**
22	Excel	Microsoft
12	Quattra	Borland Int'l
4	SuperCalc5	Computer Assaciates
3	Symphany	Lotus Develapment
14	Others	

70% of the respondents voted in this category



UTILITY

%	Product	Manufacturer
22	**Norton Utilities Advanced**	**Peter Norton Computing**
18	PC Tools Deluxe	Central Paint Software
13	Norton Utilities	Peter Nartan Camputing
11	PC Tools	Central Paint Software
4	Norton Cammander	Peter Nartan Computing
3	Xtree Pra	Executive Systems
29	Others	

53% of the respondents voted in this category

RELATIONAL DATA BASE

%	Product	Manufacturer
24	**dBASE IV**	**Ashton-Tate**
17	dBASE III Plus	Ashton-Tate
10	Paradox 2.0	Borland Int'l
10	Paradox 3.0	Barland Int'l
8	R:base far DOS	Micrarim
4	Faxbase + 2.1	Fax Software
27	Others	

51% of the respondents voted in this category

DESKTOP PUBLISHING

%	Product	Manufacturer
38	**Ventura Publisher**	**Xerox**
37	PageMaker	Aldus
11	First Publisher 2.0	Saftware Publishing
2	Publish It	Timeworks
2	GEM Desktap Publisher	Digital Research
10	Others	

41% of the respondents voted in this category

COMMUNICATIONS

%	Product	Manufacturer
30	**Procomm Plus**	**Datastorm Technologies**
16	Procomm	Datastorm Technologies
8	Crosstalk XVI	DCA/Crosstalk Communications
5	Crosstalk Mk.4	DCA/Crosstalk Communications
5	Smartcom II	Hayes Microcomputer Products
4	Smartcom III	Hayes Microcomputer Products
32	Others	

39% of the respondents voted in this category

OPERATING ENVIRONMENT

%	Product	Manufacturer
22	**MS-DOS/PC-DOS 3.3**	**Microsoft/IBM**
16	Microsoft Windows 2.*xx*	Microsoft
11	Microsoft Windows/386	Microsoft
10	Desqview 2.*xx*	Quarterdeck
8	MS-DOS/PC-DOS 4.0	Microsoft/IBM
33	Others	

38% of the respondents voted in this category

PROGRAMMING LANGUAGE

%	Product	Manufacturer
22	**QuickBASIC**	**Microsoft***
22	Turbo Pascal	Borland Int'l
15	Turbo C	Borland Int'l
12	Microsoft C	Microsoft
7	QuickC	Microsoft
22	Others	

37% of the respondents voted in this category

*Percentages rounded; product received largest number of votes.

BUSINESS GRAPHICS

%	Product	Manufacturer
55	**Harvard Graphics**	**Software Publishing**
13	Freelance Plus	Lotus Development
3	Micrografx Designer	Micrografx
3	Micrografx Graph Plus	Micrografx
1	Harvard Presentation Graphics	Software Publishing
25	Others	

32% of the respondents voted in this category

GAME

%	Product	Manufacturer
22	**Microsoft Flight Simulator**	**Microsoft**
5	King's Quest IV	Sierra On-Line
5	Mean-18 Golf	Accolade
5	Leisure Suit Larry	Sierra On-Line
5	F-19 Stealth Fighter	Microprose
4	Tetris	Spectrum Holobyte
54	Others	

32% of the respondents voted in this category

DESKTOP ORGANIZER

%	Product	Manufacturer
23	**SideKick Plus**	**Borland Int'l**
16	SideKick	Borland Int'l
14	PC Tools Deluxe	Central Point Software
6	PC Tools	Central Point Software
6	WordPerfect Library	WordPerfect
35	Others	

30% of the respondents voted in this category

PERSONAL FINANCE

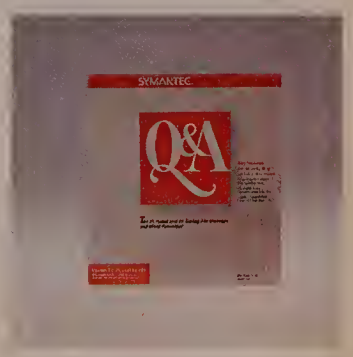
%	Product	Manufacturer
44	**Andrew Tobias' Managing Your Money**	**MECA Ventures**
27	Quicken/2	Intuit Software
9	Money Counts	Parsons Technology
6	Dollars and Sense	Managram
2	DacEasy Light	DacEasy
12	Others	

25% of the respondents voted in this category

FLAT-FILE DATA BASE

%	Product	Manufacturer
29	**Q&A 3.0**	**Symantec**
11	Professional File	Software Publishing
10	Reflex	Borland Int'l
9	PC-File Plus 2.0	ButtonWare
4	PC-File: dB	ButtonWare
37	Others	

25% of the respondents voted in this category



TAX PLANNING OR PREPARATION

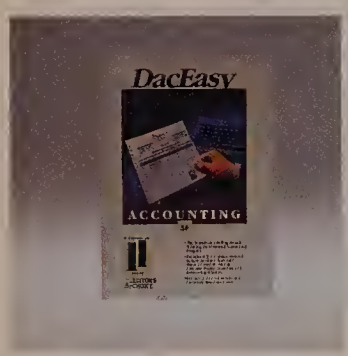
%	Product	Manufacturer
67	**TurboTax**	**Chipsoft**
6	Tax Cut	MECA Ventures
3	Taxview/Planner	Softview
3	AM Tax	AM Software
3	Andrew Tobias' Managing Your Money	MECA Ventures
18	Others	

23% of the respondents voted in this category

INTEGRATED

%	Product	Manufacturer
21	**Symphony**	**Lotus Development**
17	Micrasaft Warks	Micrasaft
14	PFS: First Chaice	Saftware Publishing
13	Framewark III	Ashtan-Tate
6	SmartWare	Infarmix
29	Others	

23% of the respandents voted in this category



ACCOUNTING

%	Product	Manufacturer
22	**DacEasy Accounting**	**DacEasy**
14	Peachtree Complete II	Peachtree Saftware
8	Bedfard Integrated Accaunting	Bedfard Saftware
5	Quicken/2	Intuit Saftware
4	BusinessWarks PC	Manzanita
47	Others	

23% of the respandents voted in this category

COMPUTER-AIDED DESIGN

%	Product	Manufacturer
45	**AutoCAD**	**Autodesk**
16	DesignCAD 3-D	American Small Business
15	Generic CADD	Generic Saftware
3	EasyCAD	Evalutian
3	Micragrafx Designer	Micragrafx
18	Others	

21% of the respandents voted in this category

SPREADSHEET UTILITY

%	Product	Manufacturer
37	**Allways**	**Funk Saftware**
20	Sideways	Funk Saftware
6	HAL	Latus Develapment
3	SQZ Plus	Symantec
3	SeeMare	Persanics
31	Others	

20% of the respandents voted in this category

WORD PROCESSING UTILITY

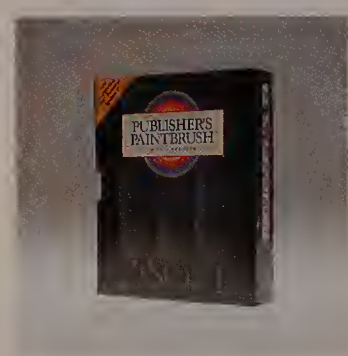
%	Product	Manufacturer
21	**RightWriter 3.0**	**RightSoft**
17	Grammatik III	Reference Saftware
10	WardPerfect Library	WardPerfect
3	Ward Finder	Micralytics
3	Turba Lightning	Barland Int'l
46	Others	

20% of the respandents voted in this category

LOCAL AREA NETWORK—OPERATING SYSTEM

%	Product	Manufacturer
56	**Advanced NetWare**	**Novell**
10	TOPS	Sun Micrasystems
4	3+Share	3Cam
3	Vines	Banyan Systems
2	LANtastic	Artisaft
25	Others	

17% of the respandents voted in this category



DESKTOP PUBLISHING UTILITY

%	Product	Manufacturer
9	**Publisher's Paintbrush**	**Z-Soft**
8	Fantware	Bitstream
7	Ventura Prafessianal Extensian	Xerax
5	Micragrafx Designer 2.0	Micragrafx
4	PC Paintbrush	Z-Saft
67	Others	

10% of the respandents voted in this category

MOST PROMISING NEWCOMER—SOFTWARE

%	Product	Manufacturer
10	**Agenda**	**Latus Develapment**
6	dBASE IV	Ashtan-Tate
3	Paradax 3.0	Barland Int'l
3	PC Taals Deluxe 5.0	Central Paint Saftware
3	Allways	Funk Saftware
75	Others	

27% of the respandents voted in this category

POWER TIP NO. 71

Editing On Line With Smartcom

Smartcom III's Peruse buffer and text editor make it easy to edit information quickly during an on-line session so you can retransmit it. During the session, press <F6> to activate the Peruse buffer. Press <Alt>-S and use the cursor keys to highlight the appropriate text. Press <F3>E to copy the selection to the editor, and press <F2>E to display the editor and the captured data. When you're done, press <F4> to return to the session.

Toru Tanaka
Los Angeles, California

WHERE TO BUY

1-2-3
Lotus Development Corp.
55 Combridge Porkwoy
Cambridge, MA 02142
617/623-6572
Reader service no. 650

AboveBoard Plus
Intel Corp.
5200 N.E. Elom Young Porkwoy
Mailstop C03-07
Hillsboro, OR 97124-6497
800/538-3373, 503/629-7354
Reader service no. 651

Advanced NetWare
Novell, Inc.
122 Eost 1700 South
Provo, UT 84606
800/526-5463, 801/379-5533
Reader service no. 652

Agenda
Lotus Development Corp.
Reader service no. 653

Allways
Funk Softwore
222 Third St.
Cambridge, MA 02142
800/822-3865, 617/497-6339
Reader service no. 654

Andrew Tobias' Managing Your Money
MECA Ventures
355 Riverside Ave.
Westport, CT 06880
203/222-9150
Reader service no. 655

AutoCAD
Autodesk, Inc.
2320 Morinship Way
Sousolito, CA 94965
415/332-2344
Reader service no. 656

Compaq Deskpro 386/25
Compoq Computer Corp.
P.O. Box 692000
Houston, TX 77269-2000
800/231-0900
Reader service no. 657

Compaq Portable 386
Compoq Computer Corp.
Reader service no. 658

Compaq SLT/286
Compoq Computer Corp.
Reader service no. 659

DacEasy Accounting
DocEosy Inc.
17950 Preston Rd. #800
Dallas, TX 75252
800/992-7779, 214/248-0205 Texos
Reader service no. 660

dBASE IV
Ashton-Tote
20101 Hamilton Ave.
Torronce, CA 90509-9972
213/329-8000
Reader service no. 661

Epson LQ-2550
Epson America, Inc.
23610 Telo Ave.
Torrance, CA 90505
800/922-8911
Reader service no. 662

Harvard Graphics
Software Publishing Corp.
P.O. Box 7210
1901 Londings Dr.
Mountoin View, CA 94039-7210
415/962-8910
Reader service no. 663

HP LaserJet Series II
Hewlett-Pockord
Customer Informotion Center
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900
Reader service no. 664

Microsoft Flight Simulator
Microsoft Corp.
16011 N.E. 36th Woy, Box 97017
Redmond, WA 98073-9717
800/426-9400, 206/454-2030
Reader service no. 665

Microsoft Mouse
Microsoft Corp.
Reader service no. 666

MS-DOS/PC-DOS 3.3
Microsoft Corp./IBM
Reader service no. 667

NEC MultiSync II
NEC Home Electronics (USA), Inc.
1255 Michoel Dr.
Wood Dole, IL 60191-1094
800/826-2255
Reader service no. 668

Norton Utilities Advanced
Peter Norton Computing
100 Wilshire Blvd., 9th floor
Sonto Monico, CA 90401
800/365-1010, 213/319-2010
Reader service no. 669

Procomm Plus
Dotostorm Technologies
3212 Lemone Industrial Blvd.
Columbia, MO 65201
314/474-8461
Reader service no. 670

Publisher's Paintbrush
Z-Soft Corp.
450 Fronklin Rd. #100
Morietto, GA 30067
404/428-0008
Reader service no. 671

Q&A 3.0
Symontec
Customer Service
10201 Torre Ave.
Cupertino, CA 95014
408/252-3570
Reader service no. 672

QuickBASIC
Microsoft Corp.
Reader service no. 673

RightWriter 3.0
RightSoft
4545 Somuel St.
Sorosoto, FL 34233
800/992-0244, 813/923-0233
Reader service no. 674

Seagate ST251
Seogote Technology
920 Disc Dr.
Scotts Volley, CA 95066
800/468-3472, 408/438-6550
Reader service no. 675

SideKick Plus
Borlond Int'l
1700 Green Hills Rd.
Scotts Volley, CA 95066-0001
408/438-8400
Reader service no. 676

Smartmodem 2400
Hayes Microcomputer Products
P.O. Box 105203
Atlonto, GA 30348
404/441-1617
Reader service no. 677

Symphony
Lotus Development Corp.
Reader service no. 678

Token-Ring
IBM
Morketing & Services Heodquorters
1133 Westchester Ave.
White Plains, NY 10604
800/426-2468
Reader service no. 679

TurboTax
ChipSoft
5045 Shorehom Pl.
San Diego, CA 92122
619/453-8722
Reader service no. 680

UltraLite
NEC Home Electronics (USA), Inc.
Reader service no. 681

VGA Wonder
ATI Technologies, Inc.
3761 Victorio Pork Ave.
Scorborough, Ontorio M1W 3S2 Conoda
416/756-0718
Reader service no. 682

Ventura Publisher
Xerox Desktop Software
Xerox Corp.
9745 Business Pork Ave.
Son Diego, CA 92131
800/822-8221, 619/695-7890
Reader service no. 683

WordPerfect
WordPerfect Corp.
1555 N. Technology Woy
Orem, UT 84057
800/321-4566, 801/225-5000
Reader service no. 684

Now Peter Norton

If you've ever seen the words "GENERAL FAILURE ERROR" on the screen of your PC, you know you don't need to be ill to feel sick.

All you need is a corrupted disk with some valuable data stored aboard.

When that happens, it's time to call on the remarkable new *Norton Disk Doctor.*™

The Norton Disk Doctor is one of 27 data recovery and disk management tools in the latest Advanced Edition of the Norton Utilities.®

It's also the most significant advance in utility software technology since Peter Norton first began saving the data and the derrières of grateful PC

C> FILE NOT FOUND!

Our legendary UnErase—and its short-cutting offspring Quick UnErase have saved the derrières of thousands of grateful PC users. And they're still saving them.

users around the world with the legendary—and still unequalled—*UnErase.*®

Why you need a Doctor in the house.

Now, whenever INVALID DRIVE SPECIFICATION or some other cryptic or catastrophic error message appears on your screen, you can do something besides reach for the Maalox.®

You can summon the Disk Doctor, which will

nakes house calls.

The Standard Edition gives you UnErase, the new Norton Control Center and a range of features, functions and enhancements.

determine the exact nature of the problem, report it and, in most cases, fix it for you.

All by itself.

The Disk Doctor can diagnose and repair everything from bad partition tables and boot records to mangled root directories. It can even reformat bad sectors and write back the old data.

Automatically.

In fact, if the Doctor can't cure your corrupted floppy or hard disk, then Buster, you've got one corrupt disk.

In which case, you'll need to refer to *The Norton Troubleshooter,* a 158-page guide to finding and fixing most anything that could go wrong.

Don't worry, you don't have to go to the bookstore or the library to refer to it, because the Troubleshooter is included in the Advanced Edition.

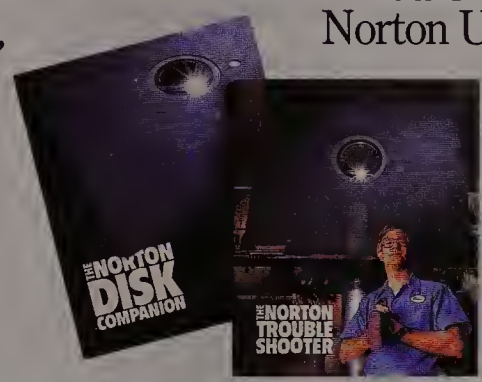
Frankly, the Norton Disk Doctor and the Norton Troubleshooter are worth the price of the new Advanced Edition all by themselves.

But, of course, they aren't by themselves.

They're accompanied by a wish list of features, functions and enhancements sufficient to satisfy the yearnings of all those people who've been politely writing and calling to request them.

The people's choices.

Like *Speed Disk,* the world's most powerful disk tuning tool, which features four user-selectable optimization methods and doesn't lose your data if you lose power.



The Norton Disk Companion is included, free, with both the Standard and Advanced Editions. The Norton Troubleshooter is yours with the Advanced Edition.

And *Format Recover,* which can unformat your accidentally reformatted hard disk even if you haven't taken any precautions beforehand.

Our user interface, which *InfoWorld* said made the Utilities "as easy to use as possible," now comes with pop-up windows and dialog boxes.

Our new *Norton Control Center*™ lets you define or alter a range of system settings—from cursor size to screen and palette colors—quickly and easily.

While our *Disk Test* finds and marks faulty areas on your disk to help you protect your data before you have a chance to lose it.

If you *want* to lose it, however, you'll be glad to know that *WipeFile*™ and *WipeDisk*™ support DoD 5220.22-M 116c(6b), the Pentagon's latest data security specification.

Which means they'll erase your files so thoroughly not even Peter Norton can find them.

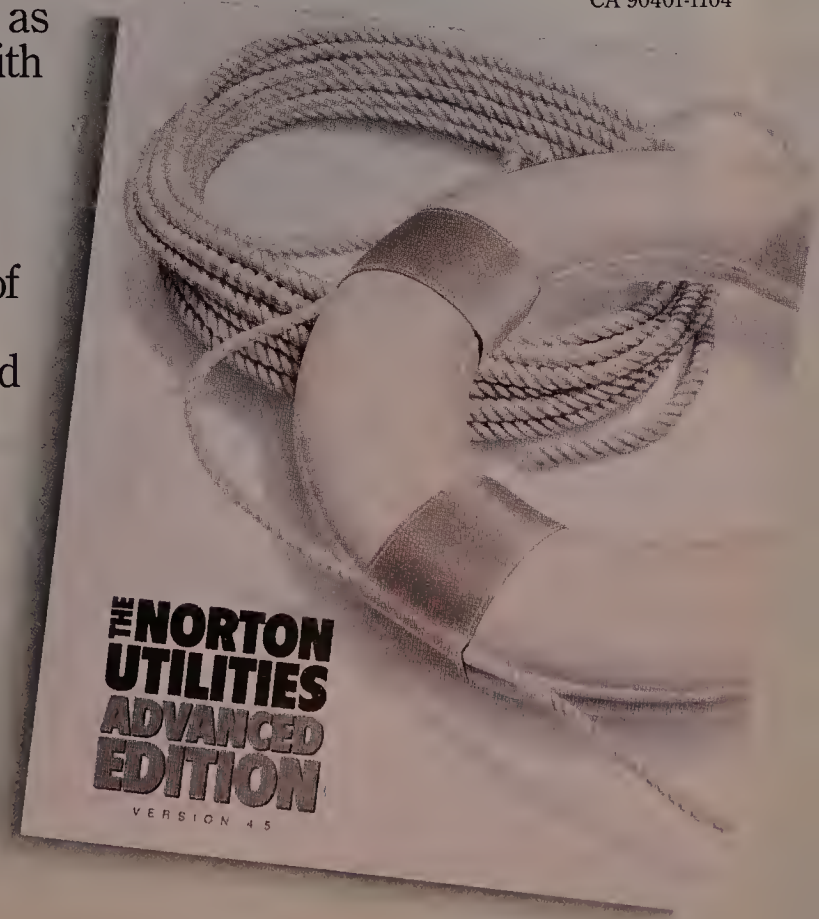
You'll find the latest Norton Utilities at your favorite software dealer.

If you haven't got a favorite software dealer, take two aspirin, call us right away at 1-800-365-1010 and place an order.

The Doctor will be on its way in no time.

Peter Norton
COMPUTING

All Utilities now support large hard disks under DOS 4.0, COMPAQ DOS 3.31, and the PC-MOS/386 multi-tasking operating system. Designed for the IBM® PS/2® and PC families and 100% compatibles. © 1988 Peter Norton Computing, Inc. 100 Wilshire Blvd., 9th Floor, Santa Monica, CA 90401-1104



Circle 92 on reader service card

DO-IT-YOURSELF

SPREADSHEET TRAINING

Self-paced training is effective and inexpensive. Our selection of videotapes, software, and books will make you a better spreadsheet user.

MATT LAKE AND WILLIAM RODARMOR

Like the weather, employee training usually gets more talk than action. Cost and lack of time are part of the reason—classroom instruction takes time and money, and most people get over-the-shoulder help from the office guru only in a crisis. That's why do-it-yourself training using videotapes, software, or books is often the most effective approach.

In the spreadsheet world, the need for training has never been greater. With recent major upgrades of the top spreadsheet products, veteran users need to learn how they can exploit the latest features, while neophytes look for

VIDEO TRAINING: Watch Your Way to Better Worksheets

SPREADSHEET Product	Vendor	Price	Level	Run-time (hours)	Format	Supplementary material	Reader service number
LOTUS 1-2-3 3.0							
Lotus 1-2-3 Rel. 3.0: Vol. 1	Anderson	$275.00[1]	adv.	0:45	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3 Rel. 3.0: Vol. 2	Anderson	275.00[1]	adv.	0:45	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Creating and Using Macros	Anderson	275.00[1]	int.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Advanced Macros	Anderson	275.00[1]	adv.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Beginning through Advanced Skills	Learn-PC	995.00	beg.–adv.	5:00	VHS/Beta 1&2/Umatic	5 books, disk	710
Using Lotus 1-2-3 (3.0)	MicroVideo	495.00	beg.	2:30	VHS/Beta/PAL/¾"	workbook, disk	711
Advanced Lotus 1-2-3 (3.0)	MicroVideo	495.00	adv.	2:30	VHS/Beta/PAL/¾"	workbook, disk	711
LOTUS 1-2-3 2.2							
Lotus 1-2-3 Rel. 2.2: Vol. 1	Anderson	$275.00[2]	beg.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3 Rel. 2.2: Vol. 2	Anderson	275.00[2]	int.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3 Rel. 2.2: Vol. 3	Anderson	275.00[2]	adv.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Creating and Using Macros	Anderson	275.00[1]	int.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Advanced Macros	Anderson	275.00[1]	adv.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Beginning through Advanced Skills	Learn-PC	995.00	beg.–adv.	5:00	VHS/Beta 1&2/Umatic	5 books, disk	710
Using Lotus 1-2-3 (2.2)	MicroVideo	495.00	beg.	2:30	VHS/Beta/PAL/¾"	workbook, disk	711
Advanced Lotus 1-2-3 (2.2)	MicroVideo	495.00	adv.	2:30	VHS/Beta/PAL/¾"	workbook, disk	711
LOTUS 1-2-3 2.0							
Lotus 1-2-3: An Introduction to the 1-2-3 Spreadsheet	Anderson	$275.00[1]	beg.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Spreadsheet Techniques, Graphics & DBM	Anderson	275.00[1]	int.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Creating and Using Macros	Anderson	275.00[1]	int.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Advanced Macros	Anderson	275.00[1]	adv.	1:00	VHS/Beta/PAL/¾"	workbook, disk	709
Lotus 1-2-3: Module I	ComputerPrep	345.00	beg.	6:00[3]	VHS/Beta	workbook, disk	712
Lotus 1-2-3: Module II	ComputerPrep	345.00	beg.	6:00[3]	VHS/Beta	workbook, disk	712
Lotus 1-2-3 Learning System	Intellisance	495.00	beg.	2:20	VHS/Beta	workbook, disk[4]	713
Joz Computer Tutor—Introduction	Jaz	29.95	beg.	1:00	VHS	none	714
Jaz Computer Tutor	Jaz	129.95	beg.–adv.	3:50	VHS	workbook	714
Lotus 1-2-3: Beginning through Advanced Skills	Learn-PC	995.00	beg.–adv.	5:00	VHS/Beta 1&2/Umatic	5 books, disk	710
Lotus 1-2-3 (2.0) Learning System	MicroVideo	495.00	beg.	2:20	VHS/Beta/PAL/¾"	workbook, disk	711
CompuTutor: Using Lotus 1-2-3	TeleMedia	95.00	beg.–int.	1:40	VHS/Beta/¾"[5]	none	715
CompuTutor: Using Lotus 1-2-3 Executive Version	TeleMedia	195.00	beg.–int.	1:40	VHS/Beta/¾"[5]	workbook, disk, audiotape	715
Using Lotus 1-2-3 Version 2.0	Video Logic	24.95	beg.	0:36	VHS	workbook	716
Introduction to Lotus 1-2-3	Video Prof.	39.95	beg.	0:43	VHS	none	717
Lotus 1-2-3 Level II	Video Prof.	39.95	int.	1:14	VHS	none	717
Lotus 1-2-3 Level III	Video Prof.	39.95	adv.	0:51	VHS	none	717
Lotus 1-2-3 Made Easy by Video	Video Response	39.95	beg.	2:00	VHS	disk	718
MICROSOFT EXCEL							
Microsoft Excel Learning System	Intellisance	$495.00	beg.–adv.	2:10	VHS/Beta	workbook, disk[4]	713
Microsoft Excel Learning System	MicroVideo	495.00	beg.	2:10	VHS/Beta/PAL/¾"	workbook, disk	711
Introduction to Excel	Video Prof.	39.95	beg.	0:58	VHS	none	717
QUATTRO							
Using Quattro	Video Logic	$24.95	beg.	0:45	VHS	workbook	716

[1] Volumes 1 and 2 are sold together for $495.
[2] Two volumes cost $495; the set of three, $695.
[3] Estimated time. The stop/start exercises make training self-paced.
[4] Additional copies of workbook and disk available at extra cost.
[5] The ¾-inch format costs extra: standard version $245; executive $345.

For more information about all products in this section, circle reader service no. 907.

third-party training materials to get them up and running faster than the program manual can. This Buyers' Guide provides a representative sampling of videotapes, software, and books that target *1-2-3* releases 3.0 and 2.2, *Excel*, *Quattro*, and *SuperCalc5*.

THE MESSAGE FROM THE MEDIUM

In the couch potato age, we're so accustomed to getting our information from the tube that videotape training is a natural. Besides being a familiar medium, it's ideally suited for groups—which explains why tapes often sport high price tags. For example, Learn-PC Video's *1-2-3* re-

COMPUTER-BASED TRAINING: Learn Spreadsheets at Your PC

● yes ○ na ■ both

SPREADSHEET Product	Vendor	Price	Level	Training time (hours)	Stand-alone	Supplementary material	Reader service number
LOTUS 1-2-3 3.0							
Lotus 3.0: New Features	DSI Micro	$179.00	beg.–int.	5–7	●	ref. book	700
Individual Training for Lotus 1-2-3	Individual Software	69.95	beg.–int.	12–16	●	workbook	701
Know-How Tutor for 1-2-3	Know How	49.95[1]	beg.–int.	5–7	○	none	702
Templates of Doom	Solor Systems	69.95	beg.–int.	5–9	○	none	703
LOTUS 1-2-3 2.2							
Know-How Tutor for 1-2-3	Know How	$49.95[1]	beg.–int.	5–7	○	none	702
Templates of Doom	Solar Systems	69.95	beg.–int.	5–9	○	none	703
LOTUS 1-2-3 2.0							
Lotus 1-2-3 Training Kit	Tutorland	$495.00	beg.–int.	6–8	○	instruc. kit[3]	704
Teach Yourself Lotus 1-2-3	Tutorland	79.95[2]	beg.–int.	6	○	ref. book	704
Teach Yourself Lotus 1-2-3	American Training	75.00	beg.–adv.	3–4	●	workbook	705
Teach Yourself Lotus 1-2-3 Macros	American Training	75.00	beg.–adv.	3–4	●	workbook	705
Managing With Lotus	American Training	75.00	beg.–adv.	3–4	●	workbook	705
Lotus: Macros & Other Advanced Features	DSI Micro	179.00	adv.	5–7	●	ref. book	700
Individual Training for Lotus 1-2-3	Individual Software	69.95	beg.–int.	12–16	●	workbook	701
Individual Training for Lotus 1-2-3 Macros	Individual Software	69.95	int.–adv.	12–16	●	workbook	701
Intro./Int. Training for Lotus 1-2-3	Intellisance	179.95	beg.–int.	6–8	■	workbook	706
Advanced Training for Lotus 1-2-3	Intellisance	179.95	adv.	6–8	■	workbook	706
Lotus 1-2-3 SoundWare	Interactive Training	495.00	beg.–adv.	6–10	○	audiotape[4]	707
Know-How Tutor for 1-2-3	Know How	49.95[1]	beg.–int.	5–7	○	none	702
Mastering Lotus 1-2-3 with Ease, I & II	Softies	69.95	beg.–adv.	3–4	●	ref. book[5]	708
Templates of Doom	Solar Systems	69.95	beg.–int.	5–9	○	none	703
MICROSOFT EXCEL							
Microsoft Excel Training Kit	Tutorland	$495.00	beg.–int.	6–8	○	instruc. kit[3]	704
Teach Yourself Microsoft Excel	Tutorland	89.95[2]	beg.–int.	6	○	ref. book	704
Know-How Tutor for Microsoft Excel	Know How	49.95[1]	beg.–int.	5–7	○	none	702
Templates of Doom	Solor Systems	69.95	beg.–int.	5–9	○	none	703
SUPERCALC5							
Mastering SuperCalc With Ease, I & II	Softies	$69.95	beg.–adv.	3–4	●	ref. book[5]	708
QUATTRO							
Templates of Doom	Solar Systems	$69.95	beg.–int.	5–9	○	none	703
Mastering Quattro With Ease, I & II	Softies	69.95	beg.–adv.	3–4	●	ref. book[5]	708

[1] For orders of ten or more, $19.95 each.
[2] Price includes two modules, available separately at $59.95 each.
[3] Instruction kit includes instructor's manual and ten student workbooks.
[4] SoundWare interactive tape drive sold separately for $199.
[5] Program includes index, glossary, and quizzes.

For more information about all products in this section, circle reader service no. 906.

lease 3.0 tape costs nearly $1000, about as much as a day of on-site training by an instructor. The payoff is that over time, one tape can train an entire department, and employees can always take the tape home for reruns. But tapes have one big handicap: They don't provide feedback.

Videotape's disadvantage is software-based training's strength: interaction. It's hard to beat single-disk, computer-based training (CBT) packages, which are inexpensive and often engaging. Pop the witty *Templates of Doom* in your PC at quitting time, and you risk missing supper.

Most CBT packages have the advantage of being *concurrent*, meaning they run as templates within the very programs they teach. This immediacy lends a real-world flavor to the process, enabling students to quickly apply the lessons to their own worksheets. On the other hand, a stand-alone training program like DSI Micro's *Lotus 3.0: New Features* provides only a simulation, the advantage being that you can actually learn the program before you buy the upgrade.

Finally, don't forget the computer's worthy competitor, the book. Like a pencil, it's always on hand, works on a plane, and never interrupts you. This year the *1-2-3* upgrades have loosed such a flood of new books, we've listed only those being released in 1989. Pound for pound, books are certainly the great bargains in training materials (at 1200 pages, Mary Campbell's gargantuan *1-2-3 Release 3: The Complete Reference* sells for under thirty bucks). But their real virtue is that they help you both learn and remember. If you ever forget an @ function, the reference is as close as your bookshelf. ●

Matt Lake is an editorial assistant and William Rodarmor an assistant editor for PC World.

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SPREADSHEET Title	Author(s)	Publisher	Pages	Price	Level	Type	Reader service number
LOTUS 1-2-3 3.0							
Lotus 1-2-3 for Beginners	Abocus	Abocus	220	$18.95	beg.	tut.	719
The Lotus Guide to 1-2-3 Rel. 3	David Bookbinder	Addison-Wesley	880	22.95	beg.–adv.	tut./ref.	720
The Lotus Guide to @Functions	Mary Campbell	Addison-Wesley	288	19.95	int.–adv.	tut./ref.	720
The 1-2-3 Upgrade Guide	Michael Lunsford	Bantom	256	16.95	beg.–adv.	tut.	721
1-2-3 for the Corporate User	Coin/Cain	Brady	352	21.95	int.	tut.	722
1-2-3 Spreadsheet Design	John Nevison	Brody	320	21.95	beg.–adv.	tut.	722
Fast Access Lotus 1-2-3 Rel. 3	McClure/Abdil	Brady	320	16.95	beg.–adv.	tut.	722
Inside Lotus 1-2-3 Macros (Revised)	Ridington/Tucker	Brady	400	29.95	beg.–adv.	tut.	722
Structured Programming With Lotus 1-2-3	Cain/Cain	Brady	352	23.95	adv.	tut.	722
Total 1-2-3 Rel. 3	Bennett/Randall	Brady	696	24.95	beg.–adv.	tut./ref.	722
Understanding Lotus 1-2-3 (3.0)	Alan Simpson	Howord Sams	350	19.95	beg.	tut.	723
Lotus 1-2-3 Rel. 3	Andrew Williams	John Wiley	500	22.95	int.–adv.	tut.	724
1-2-3 from 2 to 3	The LeBlond Group	Osborne	650	24.95	int.–adv.	tut./ref.	725
1-2-3 Rel. 3 Made Easy	Mary Campbell	Osborne	600	19.95	beg.–int.	tut.	725
1-2-3 Rel. 3: The Complete Reference	Mory Campbell	Osborne	1200	28.95	beg.–adv.	ref.	725
Using 1-2-3 Rel. 3	Matthews/Matthews	Osborne	500	22.95	beg.–adv.	tut.	725
1-2-3 Rel. 3 Quickstort	Que	Que	450	21.95	beg.	tut.	726
1-2-3 Database Techniques	Dick Andersen	Que	450	22.95	int.–adv.	ref.	726
1-2-3 Rel. 3 Business Applications	Edward Donie	Que	550	39.95	int.–adv.	ref./disk	726
1-2-3 Tips, Tricks, and Traps (3rd ed.)	Dick Andersen	Que	550	22.95	int.	tut./ref.	726
Upgrading to 1-2-3 Rel. 3	Que	Que	400	14.95	beg.–odv.	tut.	726
Using 1-2-3 Rel. 3	Que	Que	900	24.95	beg.–int.	tut./ref.	726
The ABCs of Lotus 1-2-3 (2nd ed.)	Bill Kling	Scott, Foresman	432	19.95	beg.	tut./ref.	727
Learning New Lotus 1-2-3	John Annaloro	Scott, Foresman	256	21.95	beg.–int.	tut./ref.	727
Lotus 1-2-3 Instant Reference Rel. 3	Sybex	Sybex	320	12.95	beg.–int.	ref.	728
Mastering 1-2-3 Rel. 3	Corolyn Jorgensen	Sybex	720	24.95	beg.–adv.	tut.	728
The ABC's of 1-2-3 Rel. 3	Judd Robbins	Sybex	275	19.95	beg.	tut.	728
The Complete Lotus 1-2-3 Rel. 3 Handbook	Greg Harvey	Sybex	675	24.95	beg.–adv.	tut./ref.	728
Encyclopedia of Lotus 1-2-3, Rel. 3.0	Robin Stark	Tob/Windcrest	496	24.95	beg.–adv.	ref.	729
Lotus 1-2-3 Simplified, Rel. 3.0	David Bolocan	Tab/Windcrest	272	19.95	beg.	tut.	729
The Stephen Cobb User's Handbook to Lotus 1-2-3 Rel. 3.0	Stephen Cobb	Tob/Windcrest	448	24.95	int.–adv.	tut.	729
Illustrated Lotus 1-2-3 Rel. 3.0	Ralph Mylius	Wordware	320	21.95	beg.–adv.	tut./ref.	730
LOTUS 1-2-3 2.2							
The Lotus Guide to Leorning 1-2-3 Rel. 2.2	Lotus Dev. Corp.	Addison-Wesley	600	$22.95	beg.–int.	tut./ref.	720
The Lotus Guide to @Functions	Mary Campbell	Addison-Wesley	288	19.95	int.–odv.	tut./ref.	720
Fost Access Lotus 1-2-3 Rel. 2.2	McClure/Abdil	Brady	320	16.95	beg.–odv.	tut.	722
Total 1-2-3 Rel. 2.2	Bennett/Randall	Brady	696	24.95	beg.–adv.	tut./ref.	722
The Best Book of: Lotus 1-2-3 (2.2)	Alan Simpson	Howard Sams	650	24.95	beg.–int.	tut.	723
Understanding Lotus 1-2-3 (2.2)	Alan Simpson	Howard Sams	400	19.95	beg.	tut.	723
1-2-3 Rel. 2.2 Made Eosy	Mory Compbell	Osborne	600	19.95	beg.–int.	tut.	725
1-2-3 Rel. 2.2: The Complete Reference	Mary Campbell	Osborne	850	27.95	beg.–adv.	ref.	725
Using 1-2-3 Rel. 2.2	The LeBlond Group	Osborne	700	24.95	beg.–adv.	tut./disk	725
Lotus 1-2-3 Instont Reference Rel. 2.2	Sybex	Sybex	320	12.95	beg.–int.	ref.	728
Mastering 1-2-3 Rel. 2.2	Carolyn Jorgensen	Sybex	750	24.95	beg.–int.	tut.	728
Quick Guide to 1-2-3: The Visual Approach	Jeff Woodward	Sybex	300	19.95	beg.	tut.	728
The ABC's of 1-2-3 Rel. 2.2	Gilbert/Williams	Sybex	300	19.95	beg.–int.	tut.	728
The Complete Lotus 1-2-3 Rel. 2.2 Handbook	Greg Harvey	Sybex	625	24.95	beg.–adv.	tut./ref.	728
MICROSOFT EXCEL							
Excel for Beginners	Abacus	Abacus	220	$18.95	beg.	tut.	719
Excel: A Business User's Guide	Neil Salkind	John Wiley	384	21.95	int.	tut.	724
Complete Guide to Microsoft Excel Macros	Charles Kyd	Microsoft	600	24.95	int.–adv.	tut./ref.	731
Microsoft Excel Business Source Book	Charles Kyd	Microsoft	584	24.95	int.–adv.	tut.	731
Excel Business Applications: IBM Version	John Annaloro	Que	550	39.95	int.–adv.	ref.	726
Excel Quickstart	Que	Que	400	19.95	beg.	tut.	726
Excel Tips, Tricks, and Traps	Ron Person	Que	500	22.95	int.	ref.	726
Using Excel: IBM Version	Person/Campbell	Que	804	24.95	beg.–int.	tut./ref.	726
Excel Macros for the IBM	John Annaloro	Scott, Foresman	256	21.95	int.–adv.	tut./ref.	727
Excel Problem Solver	John Annaloro	Scott, Foresman	170	8.95	beg.–int.	tut.	727
Hands-On IBM Excel	Goodman/McComb	Scott, Foresman	352	22.95	int.–adv.	tut./ref.	727
Mastering Excel on the IBM PC	Carl Townsend	Sybex	628	24.95	beg.	tut.	728
Encyclopedio of Excel	Stark/Satonion	Tab/Windcrest	496	22.60	odv.	ref.	729
The Stephen Cobb User's Handbook to Excel	Stephen Cobb	Tob/Windcrest	400	24.60	int.–adv.	tut.	729
Illustrated Microsoft Excel 2.01	Schlieve/Young	Wordware	288	21.95	beg.–adv.	ref.	730
QUATTRO							
Mary Campbell's Quattro Handbook	Mary Campbell	Bantam	544	$24.95	beg.–adv.	tut./ref.	721
The Power of Quattro	Neil Salkind	John Wiley	384	18.95	beg.	tut.	724
Using Quattro	David Gobel	Que	675	21.95	beg.–int.	tut./ref.	726
The ABCs of Quattro	Bill Kling	Scott, Foresman	384	21.95	beg.	tut./ref.	727
Insider's Guide to Quattro	Clifford Phillip	Scott, Foresman	224	21.95	int.–adv.	ref.	727
Illustrated Quottro	Shulman/Shulman	Wordware	366	19.95	beg.–adv.	tut./ref.	730
SUPERCALC5							
Software Guide: Using SuperCalc5	Ernest Colantonio	DC Heoth	126	$18.66	beg.	tut./disk	732
Using SuperCalc5	Perry/Lateer	Que	575	22.95	beg.–int.	tut./ref.	726
SuperCalc5 Macro Book	Lester Karpus	Scott, Foresman	352	21.95	int.–adv.	tut./ref.	727
Mastering SuperCalc5	Harvey/Andrasak	Sybex	500	24.95	beg.–int.	tut.	728
Illustrated SuperCalc5	Jerry Yancey	Wordware	320	21.95	beg.–adv.	tut./ref.	730

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WHERE TO BUY

Abacus Software
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Grand Rapids, MI 49512
800/451-4319,
616/698-0330,
616/698-0325 (fox)

Addison-Wesley
Jacob Way
Reading, MA 01867
800/447-2226,
617/944-3700,
617/944-9338 (fax)

American Training Int'l
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213/823-1129,
213/827-1636 (fax)

Anderson Soft-Teach
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408/434-0100,
408/434-0180 (fax)

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212/420-5954 (fax)

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800/428-7267,
317/298-5400,
317/298-5604 (fax)

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125 Shareway Rd.
#3000
San Carlos, CA 94070
800/331-3313,
415/595-8855,
415/595-5619 (fax)

Intellisance Corp.
1885 Lundy Ave.
San Jase CA
95131-1899
800/982-1213,
408/432-0430,
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Interactive Training Technologies
5289 N.E. Elam Yaung
Pkwy., #D600
Hillsboro, OR
97124-6428
503/681-0343,
503/681-8459 (fax)

Jaz and Associates
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John Wiley & Sons, Inc.
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212/850-6088 (fax)

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415/546-7888,
415/546-5130 (fax)

Learn-PC Video Systems
5101 Hwy. 55
Minneapolis, MN
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612/544-4500,
612/544-1243 (fax)

Microsoft Press
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206/882-8088,
206/883-8101 (fox)

MicroVideo Learning Systems
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212/255-3108,
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Berkeley, CA 94710
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415/549-6603 (fax)

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Carmel, IN 46032
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1900 E. Lake Ave.
Glenview, IL 60025
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312/729-8910 (fax)

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303/239-9950,
303/233-0822 (fax)

Video Response
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Sandy, UT 84093
801/561-8484,
801/571-3877 (fax)

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Dallas, TX 75287
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214/407-0914 (fox)

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Plano, TX 75074
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214/423-0090,
214/881-9147 (fax)

POWER TIP NO. 72

Recalculate 1-2-3 Data With Professional Write

Professional Write can import *1-2-3* ranges into documents for tables or charts, but suppose you decide to add new numbers and need to recalculate your data once it's imported? You can use *Professional Write's* built-in calculator to tally up rows and columns. First, mark the row or column as a rectangular block by pressing <F3> and highlighting it using the cursor keys. Press <F10><Ctrl>-M to convert the highlighted information into a formula and transfer it to the calculator. After you edit the formula and recalculate it, press <Enter> to return to the original document. Move the cursor to the appropriate location and press <Enter> again to paste in the result.

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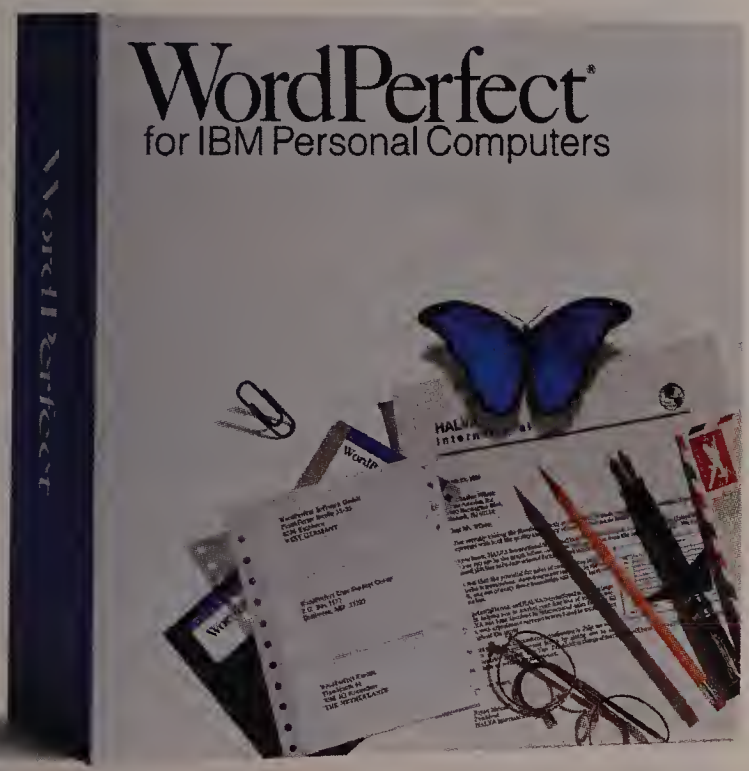

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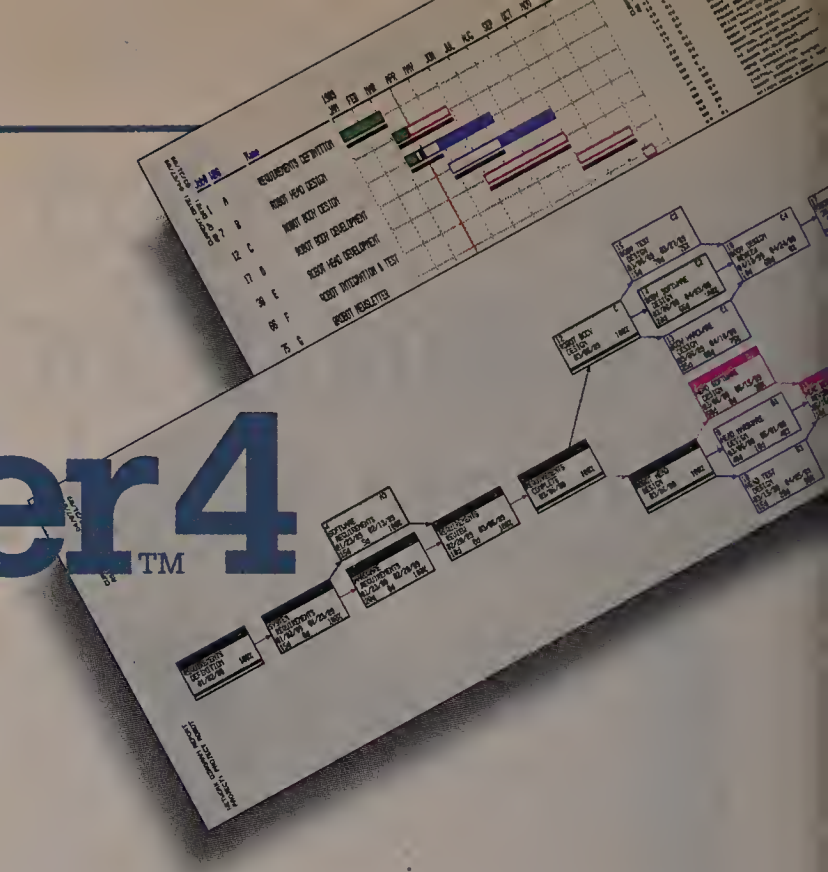
Project Scheduler 4™

The difference is graphically clear.™



Project Scheduler 4 set new industry standards for power, speed, and ease of use. Now Version 1.5 raises PC-based project management to an even higher level. In business after business, people are making the change to Project Scheduler 4. Why? The following comparisons make the reasons graphically clear.

Features	Project Scheduler 4	Time Line 3.0™
Gantt chart mode	●	●
Network chart mode	●	●
Spreadsheet mode	●	
Selectable Gantt graphics	●	
Fine grain summary Gantt charts	●	
Network chart automatic task placement	●	●
Multiple auto network draw algorithms	●	
Network chart interactive task placement	●	
Resource allocation & costing	●	●
Resource automatic time based cost inflation	●	
Resource calendars	●	
Automatic resource leveling	●	●
Interactive resource leveling	●	
Multiple project structures	●	
PERT schedule probability analysis	●	
Schedule & cost tracking	●	●
Independent multi-project support	●	
Integrated printer & plotter graphics	●	
Postscript graphics support	●	
Full data export	●	●
Full data import	●	

Benchmark	Product	Number of tasks 100	200	300	400	500
	All times in seconds					
Schedule Recalculation	Project Scheduler 4	0.8	0.9	1.0	1.1	1.2
	Time Line 3.0	10.3	22.6	372.4	1024.8	1283.6
Display Network Chart	Project Scheduler 4	1.0	1.1	1.2	1.4	1.5
	Time Line 3.0	134.5	*	*	*	*
Load Project File	Project Scheduler 4	2.7	3.8	5.7	7.7	13.5
	Time Line 3.0	18.4	32.4	84.2	180.9	244.5
Save Project File	Project Scheduler 4	3.1	4.5	5.4	6.4	8.1
	Time Line 3.0	18.1	35.6	75.0	102.4	128.0

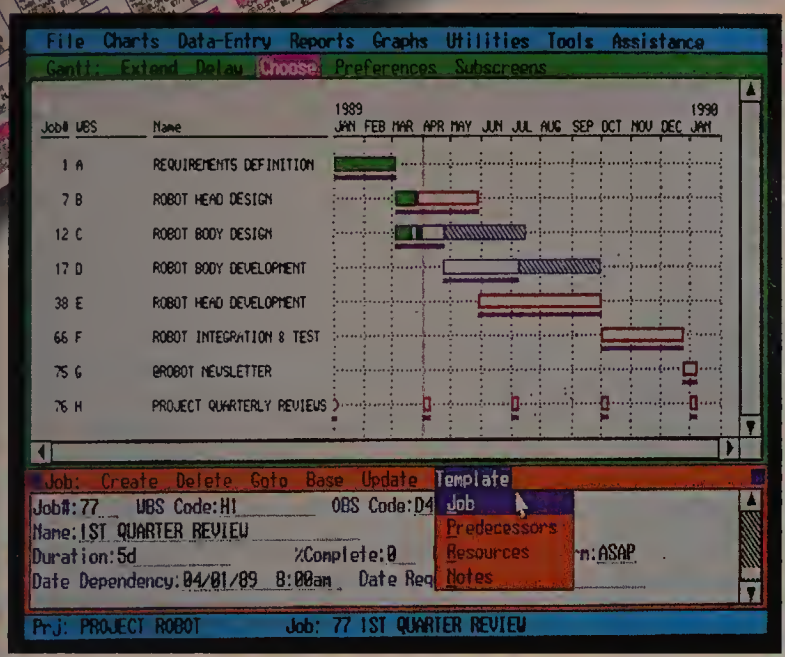
*After computing for over 12 minutes, Time Line displayed an "Unable to display Network View" message. All benchmarks were run on a 12 MHz 286 with 640k RAM.

Unmatched power at your fingertips.

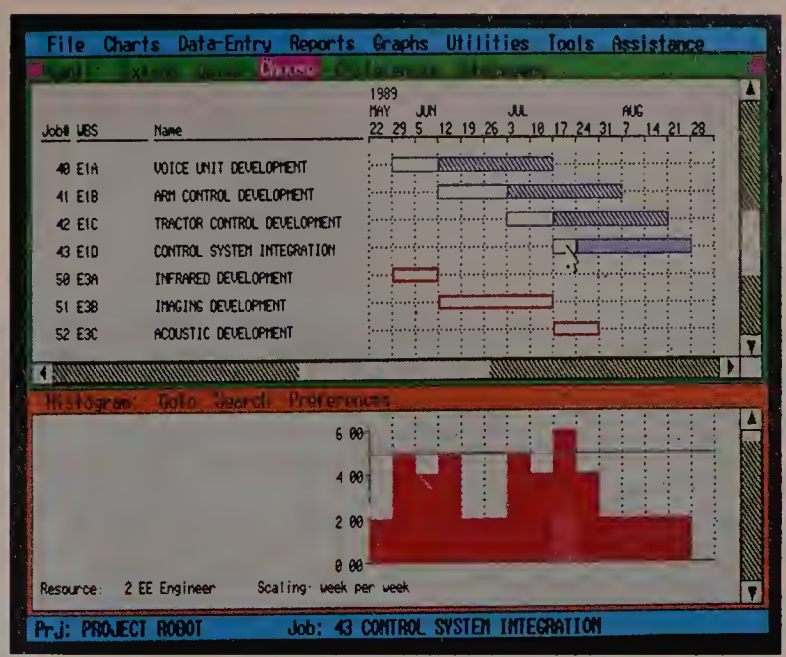
Project Scheduler 4 offers an impressive list of industry-leading power features. Projects are planned and tracked in a full graphics environment. You understand more because you see more on the screen. At last, PERT and Gantt charts make sense. Responsibilities, deadlines, and resource bottlenecks are spotted at a glance. You see more on paper, too. Beautiful, graphic reports print sideways, so you never have to cut and paste. They're instantly understandable. Not to mention simple to generate for impressive presentations.

Time-saving, world-class speed.

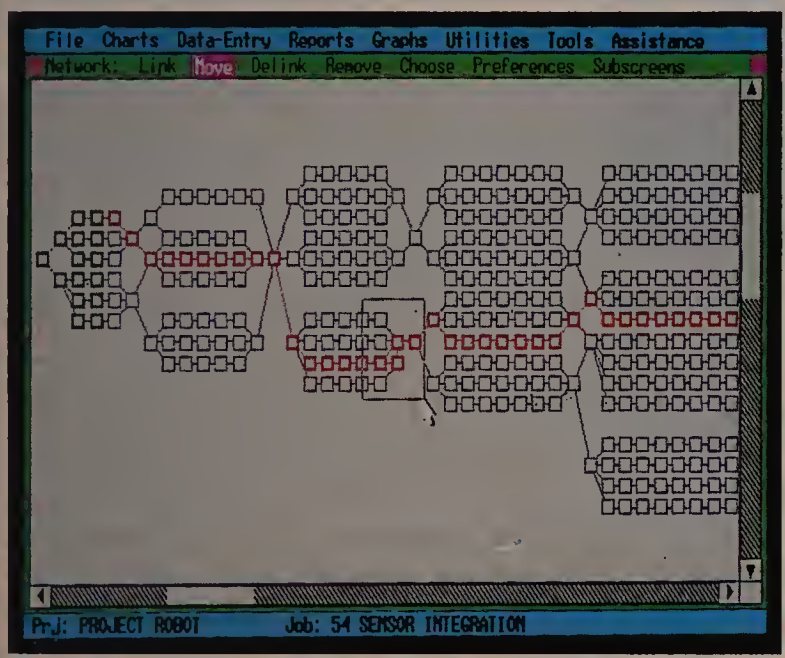
In benchmark tests, Project Scheduler 4 consistently outperforms all the competition as the fastest full-featured product in the industry—by a very wide margin. After all, what good are power features without the speed to make them useable. And the bigger your project, the more speed counts. Even at the 1000-task level, Project Scheduler 4 takes only 1.5 seconds to perform schedule recalculation. When your time is on the line, your project scheduler should help you manage it, not waste it.

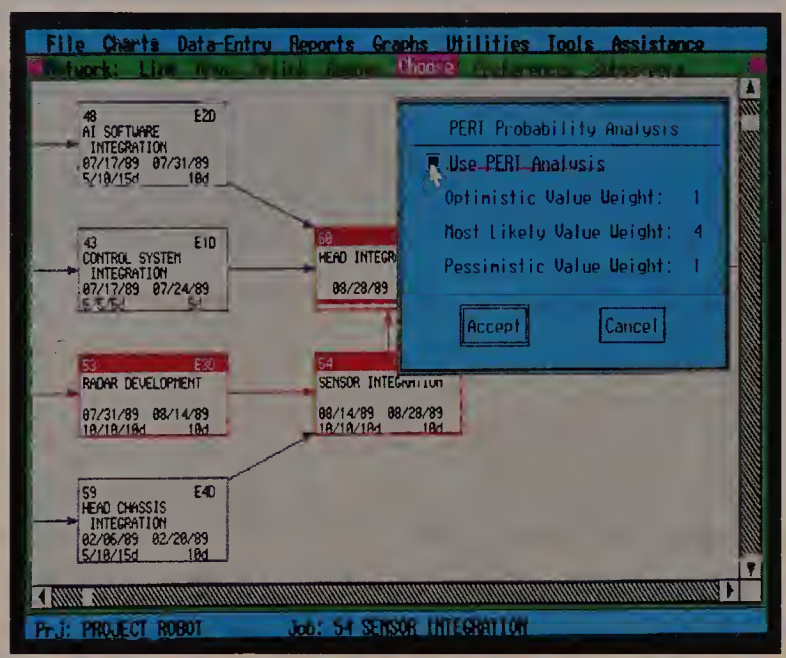


Project Scheduler 4 lets you view a Gantt chart in one window, while you enter or edit in another. Complete status information gives you a precise overview of your entire project. You control exactly what time scale is displayed: minutes, hours, days, weeks, months, or years. Display preferences include alternate symbols, free and total float, baseline, WBS and OBS filters, and much more.



In Gantt Histogram mode, a single mouse click quickly finds resource overloads and displays problem tasks. To see the planned resource utilization for a task, point at it in the Gantt chart, and the corresponding area in the histogram is automatically shaded. You may level resources interactively using Extend or Delay mode to eliminate resource overloads with a single click of the mouse.





Four reduced network zoom levels let you view the amount of detail you need to see. Each level provides drawing tools for positioning tasks in the network and changing predecessor relationships. When working with PERT analysis, Project Scheduler 4 lets you control probability weights and specify alternative task durations, while the program instantly recalculates the critical path.

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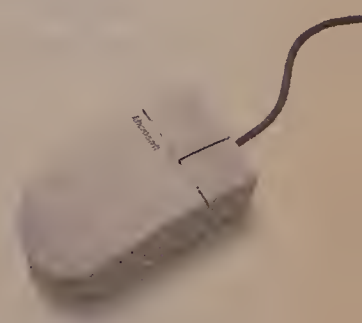

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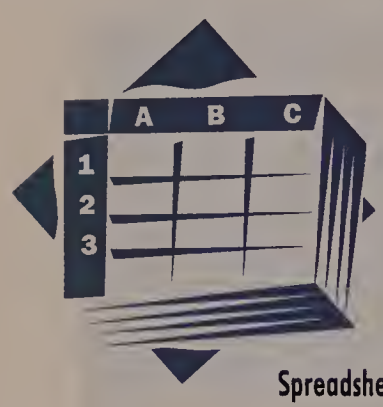
Exploring 1-2-3's Third Dimension

Ready for some reorganizing? Release 3's 3-D worksheet designs and new data base features let you build tighter, more efficient applications.



Richard Scoville

INSIDE HOW TO

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If you're like many veteran *1-2-3* users, release 3 may at first seem like a solution in search of a problem. What exactly can you do with a 3-D spreadsheet that you couldn't do with the old *1-2-3?* The answer is, organize. The third dimension lets your spreadsheet models fit better with reality, where the third dimension might be time, departments, or locations. It helps tame large applications by letting you divide them into manageable, memory-efficient modules. And it provides flexibility in the form of more efficient consolidation techniques and easier use of macros.

This article illustrates how to use release 3.0's new capabilities to organize worksheets, consolidate templates, shrink data base applications, and create truly modular worksheets.

3-D Worksheets: The Basics

1-2-3 release 3's 3-D feature is a logical extension of release 2's two-dimensional system. As a warmup, let's review the steps involved in constructing the 3-D data table shown in **SCREEN 1**. It shows the prospective monthly payments on an auto loan as a function of loan amount, interest rate, and term.

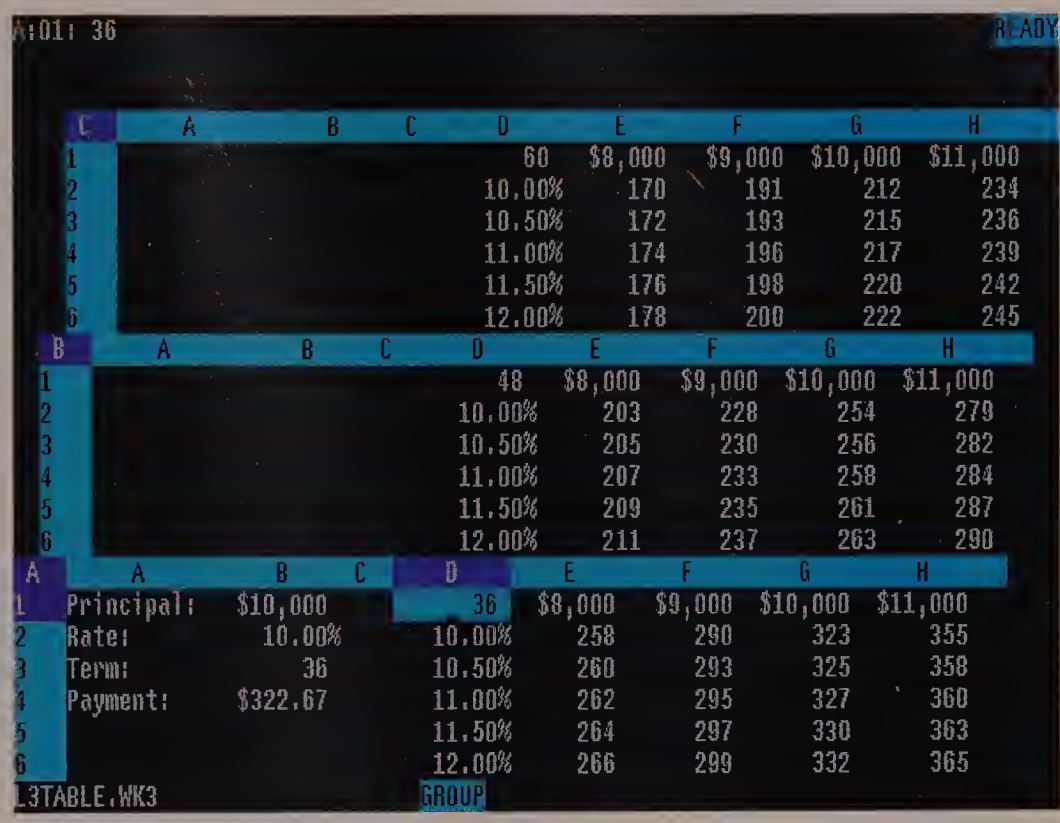
Starting with a blank worksheet, begin by inserting two additional sheets using */Worksheet Insert Sheet After* **2 <Enter>**. Now you have sheets labeled A, B, and C, but you can't see them all at once until you use the command */Worksheet Window Perspective.* To format all three

sheets together, use */Worksheet Global Group Enable.* This command locks the formatting of the three sheets together; when you make column width or formatting changes in sheet A, they will extend automatically to B and C. Set the global format to (,0) using */Worksheet Global Format* , **0**.

With the cell pointer in column A of sheet A, use */Worksheet Column Set-Width* to change the width of column A in the grouped sheets A, B, and C to 12 characters. Set the width of column C to 4. Use */Range Format Currency* **0** to format cell B1 to (C0) format, */Range Format Percent 2* for cell B2, and */Range Format Currency 2* for B4.

Enter the labels shown in column A of sheet A in **SCREEN 1** and enter the numbers shown into A:B1..A:B3 (that's sheet A, range B1..B3). In A:B4, enter the formula **@pmt(B1,B2/12,B3)**.

Next, set up the table in A:D1..C:H6. Start in sheet A in cell E1, and enter the loan amounts in row 1. With */Range Format Currency* **0**, format them to (C0). Now, copy them to the other two sheets: Press /, select *Copy,* highlight A:E1..A:H1, press **<Enter>**, then type . to anchor, and press **<Ctrl>-<Page Up>** twice to highlight A:E1..C:E1. Press **<Enter>** to finish your first 3-D copy. Use a similar procedure to enter, format, and copy the interest rates shown in A:D2..C:D6. Finally, enter the loan terms in months: Enter **36**, **48**, and **60** in A:D1, B:D1, and C:D1, respectively.



SCREEN 1: Here's a basic example of a 3-D worksheet that calculates the interest on an auto loan.

Now, finish off the application by constructing the payment table. Position the cell pointer at A:D1, and execute the command */Data Table 3.* At the Table range prompt, type . to anchor, press **<End> <Cursor Right>** to highlight across to A:H1, press **<Cursor Down>** to highlight A:D1..A:H6, press **<Ctrl>-<Page Up>** twice to highlight A:D1..C:H6, and press **<Enter>**. Specify **B4** as the formula cell, **B2** as input cell 1, **B1** as input cell 2, and **B3** as input cell 3.

In a more realistic worksheet, the table could well be larger than the screen. With Worksheet Global Group still enabled, you can set titles in all three windows at once: Position the cell pointer on A:E2, and select */Worksheet Titles Both.* Now, as you scroll through the worksheets, the table labels remain in view in all three sheets. Once the core of your worksheet is formatted, you can use Worksheet Global Group Disable to turn off group mode, then insert more sheets before or after the table with independent formatting.

A Whole New World of Work

Once you're comfortable with the basic keystrokes and notation of the 3-D system, you can use *1-2-3*'s new dimension to reorganize your worksheets for optimum efficiency and maneuverability. These techniques will help you put 3-D to work.

Organize your application into modules Most worksheet applications can be divided into a series of work areas, each with a specialized function. A complex worksheet could comprise an assumptions area containing key

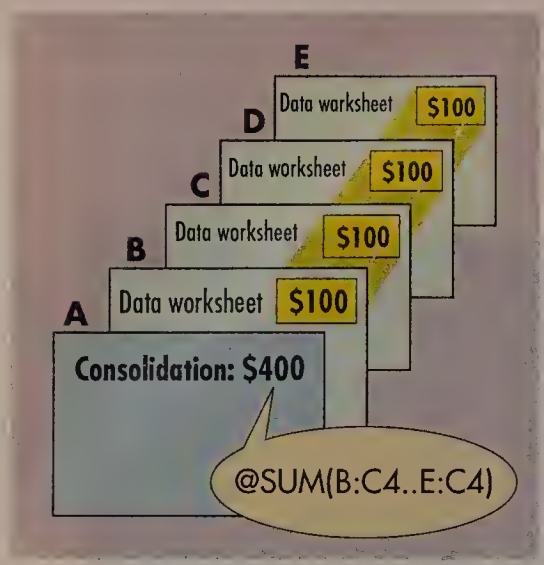


FIGURE 1: Use 3-D formulas to consolidate identically laid out worksheets.

constants and parameters, a data base containing data records, a report to print records extracted from the data base, and an additional report. In *1-2-3* release 2.01, using the diamond-back layout pattern is an excellent way of separating modules (see "Advanced Worksheet Design," *Tips & Techniques, PCW,* January 1989); in release 3, simply create a worksheet for each module. This saves memory, makes it easier to find data, and helps ensure accuracy.

Use a multisheet file to consolidate results You can use a single file with multiple worksheet modules to consolidate information across time, departments, locations, and so forth. As long as all the worksheets share an identical layout, you can use 3-D formulas to summarize the results. **FIGURE 1** shows the simplest form of worksheet consolidation in release 3. Sheets B, C, and D contain similar tables of data; sheet A is a summary report. To build the formula shown, first position the cell pointer in sheet A. Type **@sum(** and press **<Ctrl>-<Page Up>** to point to the first cell of the range to be summed. Press ., then press **<Ctrl>-<Page Up>** two more times to highlight the range. Type) and press **<Enter>** to complete and enter the formula.

The scheme shown in **FIGURE 1** works best with simple consolidations. When a single-file design grows too large, or when one module is a template that must circulate to other users to collect data, set up multiple files with linked formulas instead.

Use linked formulas with "movable" modules Let's say you're preparing a budget to include data from several divisions in your company. For the greatest flexibility, you might opt for a template system with a "detachable" template like the one in **FIGURE 2.** You prepare a general budget template and circulate copies to the division heads; they enter the figures for their division and return the data files to you. Your consolidation sheet contains linked formulas that refer to cells in each data file.

To set up this system, begin by creating a template file with range names that will be consolidated, such as Total. Save separate copies of the templates with distinctive file names like DIV1-.WK3, DIV2.WK3, and so on. Next, set up the consolidation file, then open each data file with */File Open After,* and use */Worksheet Window Perspective* to see all the files.

To create a linked formula like the one in **FIGURE 2**, position the cell pointer in the consolidation sheet, press **+**, then press **<F3>**. The other open data files appear in the name menu in double angle brackets, for example <<DIV1.WK3>>. Highlight the first appropriate file name, press **<Enter>**, and a list of the range names from that file appears. Select the range name needed for your formula, press

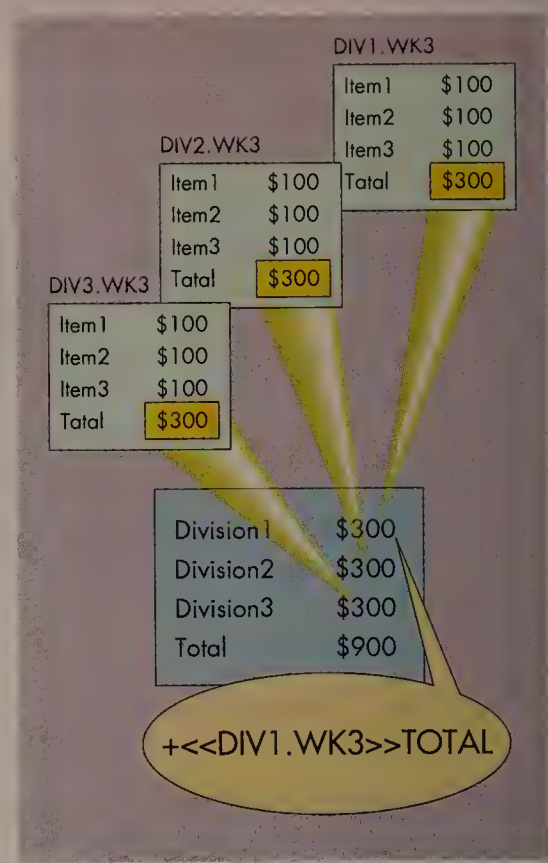


FIGURE 2: Use formula linking to consolidate dissimilar worksheets or when you can't fit all the worksheets in memory.

<Enter>, and the linked range name appears on the edit line. Press **<Enter>** again to finish the formula. Reposition the cursor, and repeat this procedure for each data file. Complete the consolidation sheet with an @sum() formula to add up the divisions' subtotals, and save all the files.

At this point, you no longer need to open the files to recalculate the results. Just make sure the data files reside in the same directory they were in when you created the linked formulas. Then retrieve the consolidation file. Any changes in the data files will be reflected there automatically.

Extend the "expandable table" concept into the third dimension In 2-D *1-2-3* tables, a standard technique for formula-intensive worksheets involves including a blank row at the bottom of an @sum() (or other) range and then insert-

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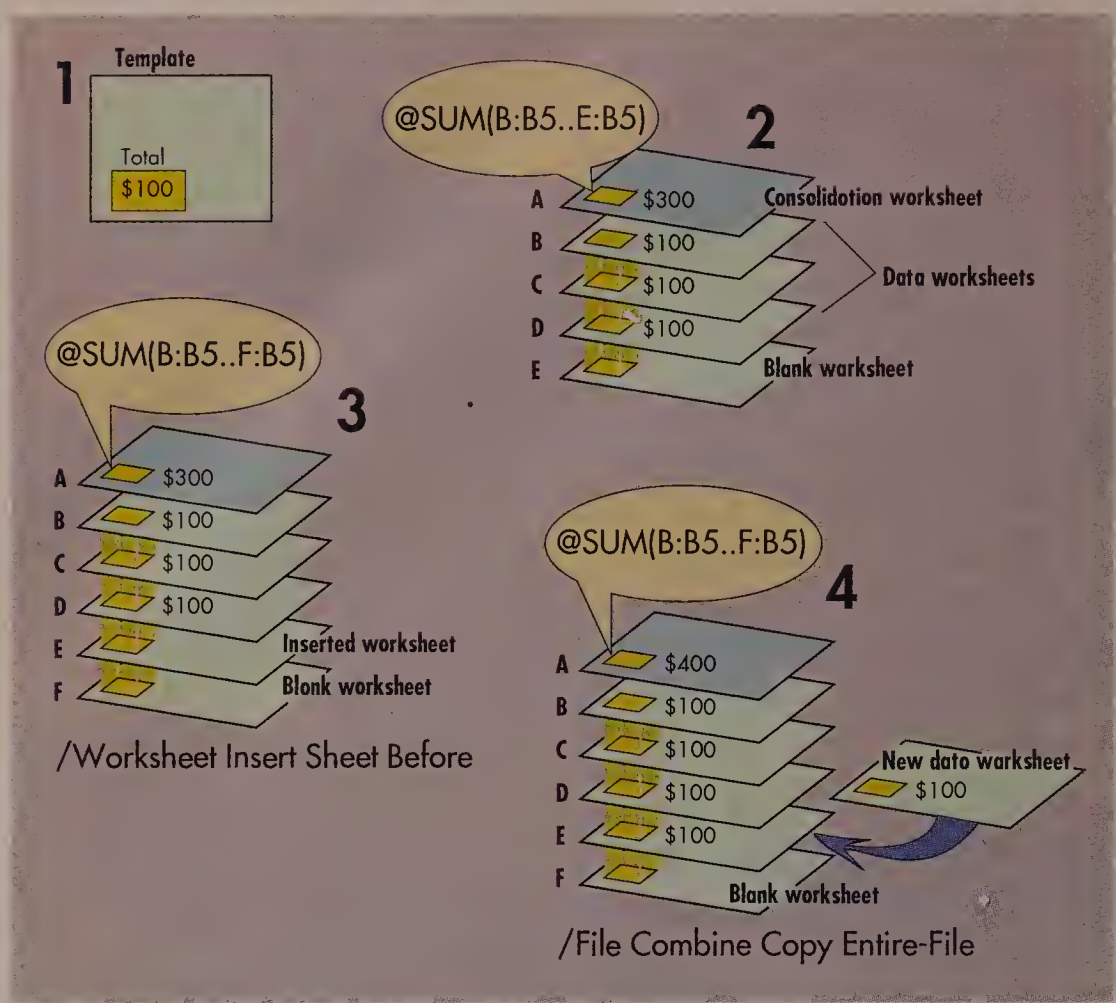

FIGURE 3: Including a blank worksheet at the bottom of a 3-D formula enables the formula to "grow" automatically when you insert a new worksheet.

ing new rows before the blank one, thus "stretching" the function's range to incorporate new data without having to modify the @sum() formula. You can use a similar 3-D technique that employs a blank sheet instead of a blank row, provided you want all your data in one file, and provided you have enough memory to hold the file's resulting structure.

Begin with a series of template worksheets with data filled in, as shown in **FIGURE 3**. The consolidation worksheet, A, contains @sum() functions (or others) that sum through a stack of worksheets and include cells in a blank worksheet at the bottom of the stack. To consolidate a new data file, first turn on group mode with */Worksheet Global Group Enable*. Put the cell pointer on the blank bottom sheet and insert a sheet with */Worksheet Insert Sheet Before 1*. Now your cell pointer appears on cell A1 of the new sheet. Assuming the next data file is ready and waiting on disk, use */File Combine Copy Entire-File* to incorporate it into the series.

Create a centralized data base for efficiency You can shrink a large application dramatically by creating a central data base of numbers and labels, then using File Extract with calculated output columns to generate the formula values you need at report time.

As a simple example, let's say you have a data base containing facts about the states: name and abbreviation (field name STATE), population (field name POP), and area in square miles (field name AREA). But what you really need to see is the population density of the states that have more than 5 million inhabitants. With release 2.01, you would add a column of formulas to the data base range to divide each population by its respective area. Then, you could extract the populous states and their densities for your report. Notice that this solution requires a formula for every state, hogging memory and recalculation time.

With release 3, you can store just the raw data, without formulas, in a data base in sheet A. Give the data (including the labels) the range name **ST_DB**, then issue */Data Query Input*, press **<F3>**, and select *ST_DB* as the data base range. In sheet B, set up a conventional criterion range. Since you want to select states by population, enter the field name **POP** in cell A1 and the formula **+ST_DB.POP>5000000** in cell A2. Then issue */Data Query Criteria*, highlight B:A1..B:A2, and press **<Enter>**. Finally, create the output range: In cell A4, enter the label **STATE**; in B4, the column where you want to see the population densities, enter **+ST_DB.POP/ST_DB.AREA**. Ignore the ERR messages that appear where you've entered formulas. Select */Data Query Output*, highlight B:A4..B:B4, and press **<Enter>**.

To extract the selected states and calculate their densities, use */Data Query Extract*. *1-2-3* selects states according to the criterion, calculates the formula for each state, and enters its value into the output area.

Harnessing 3-D Tools

1-2-3 release 3 holds the promise of powerful new techniques and a whole new style of worksheet programming. If you're a *1-2-3* power user who hasn't sampled release 3, you're in for a treat.

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TIPS & TECHNIQUES

Data Management

Personalizing Paradox

Use the Setkey command to assign keystroke shortcuts for any operation in Paradox.

What you need: Paradox 2.0 or a later version

Imagine this: You load Borland's *Paradox*, and a menu of custom data base applications appears. You select one, and a second menu lets you choose from various keyboard remappings and help levels. As you work, you perform most tasks by pressing hot keys. Some run commonly used queries, others call menus of boilerplate text and user-defined functions.

Paradox doesn't work like this out of the box, but with the Paradox Application Language (PAL) Setkey command, you can automate the program with custom hot keys. This article describes the process and shows you the first steps to creating an automatic macro-building script.

Setkey Syntax

You can add Setkey assignments to any *Paradox* script. Play the script, and all its assignments will translate into the hot keys you've defined. If you need only one set of hot keys, embed the Setkey command in the Init.sc script, which loads whenever you start *Paradox*. If different applications require different hot keys, create several scripts so you have the right set of hot keys for each job.

The Setkey syntax is straightforward: You type the word Setkey, followed by the hot key's key code, and then the commands to perform. The key code can be any PAL key code. Avoid renaming the function keys already assigned by *Paradox*. PAL refers to standard function keys as F1 through F10, <Shift>-*function key* combinations as F11 through F20, <Ctrl>-*function key* combos as F21 through F30, and <Alt>-*function keys* as F31 through F40.

You can also use alphanumeric hot keys. *Paradox* refers to <Ctrl>-*letter* combinations with positive numbers and <Alt>-*letter* combinations with negative numbers. For example, you would type 8 to create a <Ctrl>-H hot key, and -25 for <Alt>-P. Function key codes must be enclosed in quotes, but alphanumeric codes must not (see the *PAL User's Guide* appendices for the necessary codes).

The "commands to perform" can be any valid PAL commands. The string must begin with a verb (such as Play or Edit), can be followed by modifiers, and can end with a destination, such as the data base or script to be acted on. The destination must be enclosed in quotes if it is a data base table or a script.

For example, to create a <Shift>-<F2> hot key that pops open for editing a data base called Clients, you would type: Setkey "F12" Edit "Clients". To play a "Print" script with <Alt>-P, you would type: Setkey -25 Play "Print".

You can string together menu commands, enclosing each with braces, as in {MODIFY}{EDIT} "Table1". However, it's easier to use PAL menu equivalent commands, which bypass menus and don't require brackets. For example, you could shorten the previous command to Edit "Table1".

To return a key to its original definition, issue the Setkey command without the commands to perform. For example, to reset <Ctrl>-<F9>, press <Alt>-<F10>, select Miniscripts (placing you at the PAL command line), and enter Setkey "F29".

▶ A Key-Code Translator

To assist you in creating Setkey scripts, you can use the Automac script shown in **LISTING 1**. Automac prompts you through Setkey creation and translates your keystrokes into key codes, so you don't have to hunt through the *PAL User's Guide*'s appendices. However, Automac won't save the Setkeys permanently to a script —you have to do that yourself.

To install Automac, do the following:

1. Load the PAL editor by picking Scripts, Editor, and Write. Type Automac and press <Enter>.
2. Type in **LISTING 1**, and press <F2>.
3. To play Automac, select Scripts and Play, type Automac, and press <Enter>.

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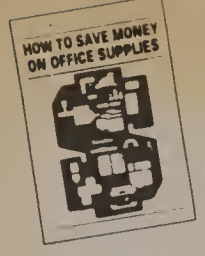

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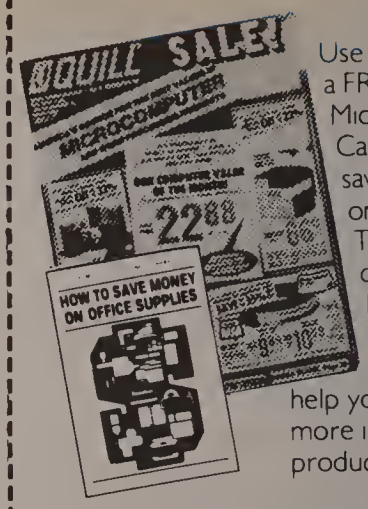

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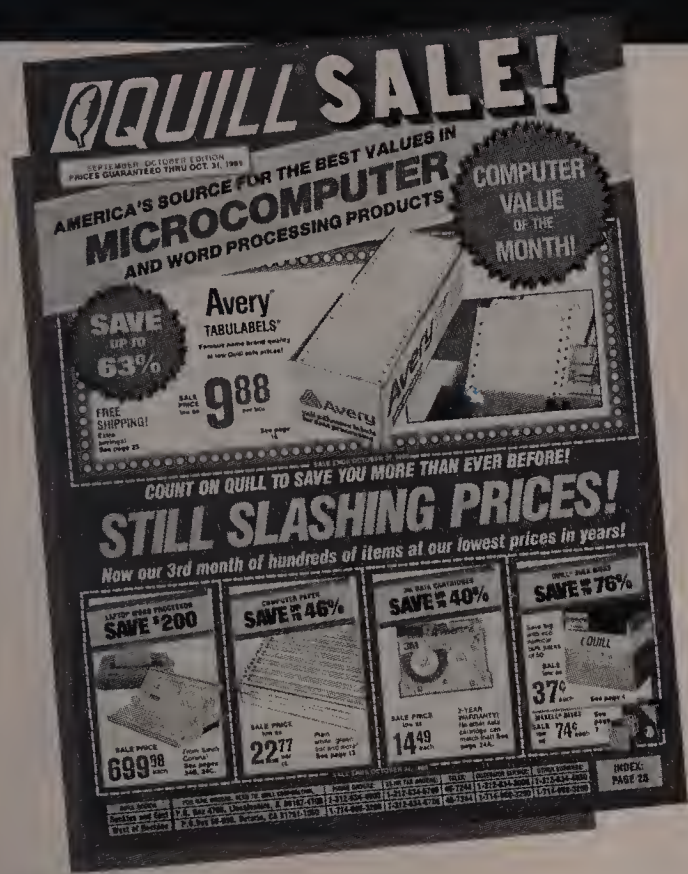

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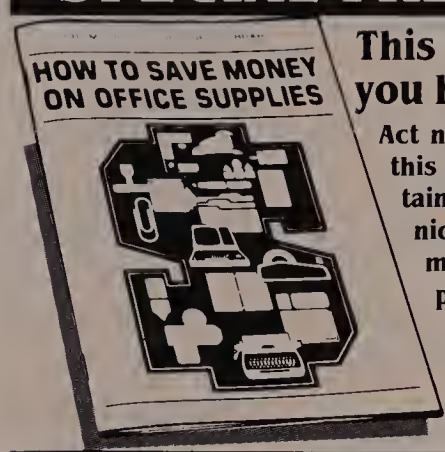

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```
Clear
Clearall
Style Reverse
@ 5,10
?? "    AUTOMAC - Paradox Macro Generator    "
Style
@ 10,10
?? "Please press KEY COMBINATION to run macro : "
X = Getchar()
@ 15,10
?? "Please ENTER COMMANDS for macro: "
Accept "A60" to KEYPR
@ 20,10
?? "You chose the key with ASCII CODE: ", X
@ 21,10
?? "With the ACTIONS: ", KEYPR
Execute "Setkey " +strval(X)+ " " + KEYPR
Sleep 1000
@ 23,10
?? "DONE - Press KEY COMBINATION again to test it now"
Sleep 4000
Clear
```

LISTING 1: Automac is a PAL script that lets you create Paradox hot keys by following on-screen prompts.

```
Clear
@ 5,10
Style Reverse
?? "Setkey Assignments"
style
@ 7,10
?? "ALT-A.....Start Automac"
@ 9,10
?? "ALT-H.....Start Helper"
@ 21,10
?? "Press any key to continue..."
X=Getchar()   ;Hold Message
```

LISTING 2: Helper creates a help screen for your Paradox Setkey assignments.

4. Automac will ask you for the hot key and command and display the appropriate key code at the bottom of the screen. Jot down each key code—you can use them later when you write permanent Setkey scripts.

▶ Permanent Hot Keys

Any hot keys you define are active only during the current session. To make them permanent, add them to a script file. In this example, we use Init.sc script so they'll load every time you start *Paradox;* however, they can be saved to any script file. Think of some useful hot keys, write out a list of Setkey command strings (or use Automac), and dig in:

1. From *Paradox*'s main menu, choose Scripts, Editor, and then Write. (If you already have an Init.sc file, select Edit instead of Write.)
2. Type Init and press <Enter>.
3. Type in the Setkey commands using the key codes displayed by Automac, pressing <Enter> after each.
4. Press <F2> to save the script.
5. To play the script, select Scripts and Play, type Init, and press <Enter>. Now you can test the hot keys.

▶ A Custom Help Screen

To display a help screen that shows all your Setkey assignments, you can write a script similar to Helper (see **LISTING 2**). Display text is preceded by ??. On the line before each description, you position the text on screen using PAL's @ operator followed by line and column numbers. To pop up the help screen with <Alt>-H, play Automac, press <Alt>-H, and enter Play "Helper".

When You're Hot...

By automating *Paradox* with Setkeys, you can minimize menuhopping. This sampling provides only a taste. With some extra programming, for example, Automac could automatically save new entries to both Init.sc and Helper. Pretty soon, you'll feel like you created *Paradox* yourself. And in a sense, you have. —*David Bouchard*

Communications

Quick-Start Procomm Scripts

Create a simple script that lets you download CompuServe messages—and master Procomm script language basics in the bargain.

What you need: Procomm Plus, a modem

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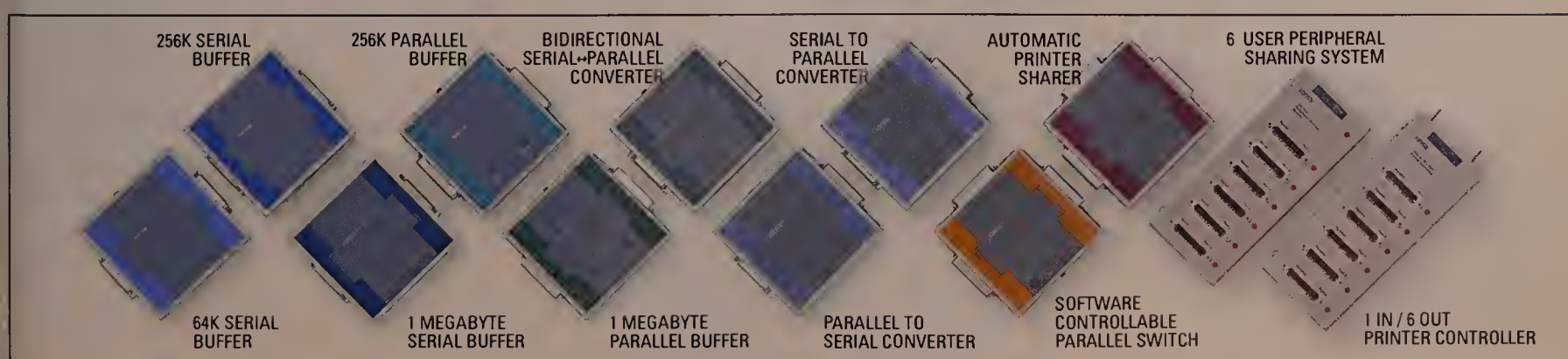

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Circle 149 on reader service card

You've already used Datastorm's *Procomm Plus*, the popular telecommunications package, to call a few on-line services, read messages, and transfer files. Now you're ready to do those repetitive tasks automatically.

Procomm Plus includes a powerful script language called Aspect, which permits automatic execution of any program function that can be done manually. This article provides a simple log-on script that will get you up and running with Aspect without having to crack the user manual.

Learn While You Log

Procomm Plus comes with several sample scripts, including one called CSERVE.ASP for logging on to the CompuServe Information Service (CIS). However, CSERVE.ASP may be confusing for newcomers. It requires customization that you should not undertake without studying the powerful Aspect commands listed in the manual.

The script in **LISTING 1**, CIS-.ASP, is a simplified version of CSERVE.ASP that adds the ability to download messages from CIS to a log file on your computer. The script will dial CIS, connect, respond to the log-on prompts, send your name and password, go to the Datastorm Support Section, download new messages, and log off. Once you understand the basic concepts, you'll be able to revise the script to work with any other forum or on-line service.

Use your word processor in ASCII mode to create CIS.ASP. Type in the script exactly as shown in **LISTING 1**, substituting your local CIS access number, user ID, and password for those listed. (Just as in BASIC, the text following the semicolon on each line is a nonexecuting comment.)

```
SET BAUD 1200                  ; Configure line settings...
SET PARITY EVEN                ; ditto
SET DATABITS 7                 ; ditto
MDIAL "474 8477"               ; Dial CIS
PAUSE 1                        ; Wait 1 second
TRANSMIT "^C"                  ; Send <Ctrl>-C
WAITFOR "User ID:"             ; Wait for CIS to ask for User ID
PAUSE 1                        ; Wait 1 second
TRANSMIT "11111,111^M"         ; Send user ID and <Enter>
WAITFOR "Password:"            ; Wait for CIS to ask for password
PAUSE 1                        ; Wait 1 second
TRANSMIT "pass:word^M"         ; Send password and <Enter>
WAITFOR "!"                    ; Wait for the CIS system prompt
TRANSMIT "GO PCVENA^M"         ; Go to the PCVENDORS forum
WAITFOR "!"                    ; Wait for prompt
PAUSE 1                        ; Wait 1 second
TRANSMIT "SS14^M"              ; Select Section 14
WAITFOR "!"                    ; Wait for prompt
LOG OPEN "NEW_MSGS.LOG"        ; Open a file to capture messages
TRANSMIT "REA NEW^M"           ; Read new messages
WAITFOR "<CR> !" FOREVER       ; Wait for prompt (messages done)
LOG CLOSE                      ; Close the log file
TRANSMIT "OFF^M"               ; Log off CompuServe
QUIT                           ; Exit script and Procomm Plus
```

LISTING 1: This simple Procomm script (CIS.ASP), written in the Aspect script language, logs on to CompuServe and downloads files automatically.

Making the Connection

Here's how the commands in CIS.ASP work:

CIS requires the modem to be set to even parity, 7 data bits, and 1 stop bit (E-7-1). The first SET adjusts the serial port to 1200 bps, and the next two SET lines establish the E-7 part of E-7-1. (*Procomm Plus* defaults to 1 stop bit.)

The MDIAL command causes your modem to dial the phone number between the quotes and (assuming a modem answers at the other end) establish a connection. The phone number may include special numbers, such as a 9 at the beginning to get an outside line.

PAUSE 1 introduces a 1-second delay to give CIS a chance to prepare for the modem's next transmission.

TRANSMIT sends whatever characters it finds between the quotes. CIS wants you to send a <Ctrl>-C (^C) as soon as a connection is established; this line does that. (To create this line, don't actually press <Ctrl>-C but type the characters ^C.)

WAITFOR pauses the script until the remote modem sends the characters found between the quotes. When WAITFOR gets what it's waiting for, the script moves on to the next command. In this case, WAITFOR waits for CIS to send the User ID log-on prompt.

After another 1-second delay, the next TRANSMIT line sends your user ID, followed by an <Enter>. *Procomm Plus* uses the two characters ^M to represent <Enter>.

The next three lines work in much the same way: The first line waits for CIS to send the Password prompt, the second

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line pauses 1 second, and the third line transmits your password, followed by <Enter>.

The next WAITFOR looks for CompuServe's ! system prompt.

Getting the Messages

The next five lines in the script move you to the PCVENDORS forum (via the CIS command GO PCVENA), wait for another ! prompt, pause for 1 second, select the Datastorm message section (via the CIS command SS14), and wait for another ! prompt. (Obviously, you can rewrite these lines to go to any forum and section on CIS.)

The LOG OPEN "NEW_MSGS.LOG" command opens a file (NEW_MSGS.LOG) in the logged subdirectory on your computer. All characters that come over the modem connection will be written to that file.

Now the script transmits the CIS command to read all new messages. Assuming you're a member of the Datastorm forum, and you've set your options to allow a continuous message scroll, the new messages will be sent to NEW_MSGS.LOG. This file can be read at your convenience with any word processor.

The next WAITFOR looks for the forum prompt again. (The <CR> is to prevent the script from mistaking an exclamation point in text for the forum prompt. FOREVER defeats Aspect's 30-second default; without it, the script would terminate after 30 seconds whether it received <CR> or not.) When the prompt arrives, all the new messages have been read, so the command LOG CLOSE closes NEW_MSGS.LOG.

TRANSMIT then sends the command to log off CompuServe. QUIT ends the script and exits *Procomm Plus*, just as if you had pressed <Alt>-X to exit the program.

(Note: CIS forums change their prompts and menus from time to time. You may need to adjust this script accordingly.)

Once your script is written, there are several ways to start it. If you're already in *Procomm Plus*, you can press <Alt>-<F5> and pick a script to execute. Alternatively, you can start a script from the DOS command line at a time of your choice (such as the middle of the night, when there's less traffic and downloads go faster) by using TEF.EXE (Timed Execution Facility), a utility provided with *Procomm Plus*. Simply enter the script name and desired log-on time in response to TEF's prompts, and *Procomm Plus* will collect the mail while you snooze. —*Michael Robertson*

Word Processing

WordPerfect + LaserJet: Prepare to Merge

Step-by-step instructions for making short work of a tough job: merge-printing envelopes with a LaserJet.

What you need: WordPerfect 5.0, HP LaserJet

Users of *WordPerfect 5.0* have little trouble learning how to merge form letters with addresses, but printing those addresses on envelopes is trickier. This article takes you through creating and merging an address list and form letter and then explains how to merge-print addresses on business-size envelopes with a LaserJet, LaserJet Plus, LaserJet Series II, or LaserJet Series IID.

Creating Primary and Secondary Files

When you generate form letters from an address list, you're combining information from a data file (known in *WordPerfect* as a secondary file) with the text that will appear in every copy of the document (called a primary file). We'll start by creating a secondary file containing names and addresses, then a primary one containing the letter's text and merge codes.

Begin the secondary file by typing a four-line record with name, address (on two lines), and salutation. Here's an example:

William Coleman^R
10904 W. New Haven Ave.^R
Jacksonville, FL 32204^R
William^R
^E

To end each line, press <F9> instead of <Enter>; this generates the special end-of-field marker, which appears on screen as ^R (see **FIGURE 1**). At the end of each record, insert the end-of-record marker ^E by pressing <Shift>-<F9> and selecting E from the merge codes displayed at the bottom of the screen. A double line will appear, marking the end of the record.

Keep typing those names, ad-

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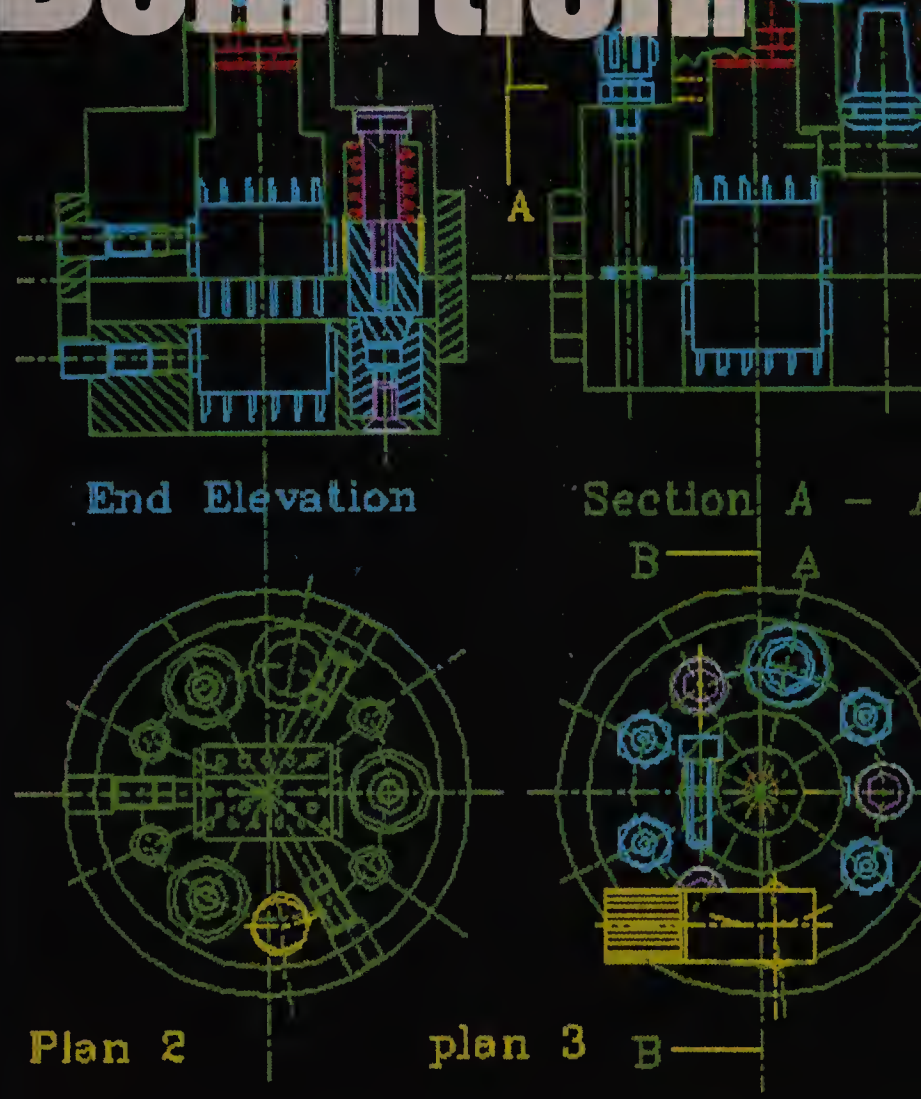

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dresses, and salutations until you've completed your address list, making sure that the same type of information (for example, the street or postal address) appears on the same line in each record. Every record must consist of five lines, and each line (even if blank) must include its merge code. Then save this secondary file to disk as **ADDRESS.SF**, and clear the screen.

Prepare the Form Letter, and Merge

Now you're ready to create the primary file. If your form letter runs less than a full page, put a page-centering code at the top: Press <Home><Home><Cursor Up>, then <Shift>-<F8>21<F7>. In any case, pop in the current date (September 15, say) by pressing **<Shift>-<F5>1**; then press **<Enter>** twice.

Next you put a series of merge commands in the primary file that will tell the program where to insert the name, address, and salutation. To insert the merge commands, you will press <Shift>-<F9> followed by F and the desired field's number. Each field number corresponds to a line in the record; field 2, for example, corresponds to the street address. Type **<Shift>-<F9>F1<Enter><Enter>** for the first line, **<Shift>-<F9>F2<Enter><Enter>** for the second, and **<Shift>-<F9>F3<Enter><Enter>** for the third. For the salutation, skip a line (**<Enter>**) and type **Dear**, a space, and **<Shift>-<F9>F4<Enter>**:. You will get a block of text that looks like this:

September 15, 1989
^F1^
^F2^
^F3^

Dear ^F4^:

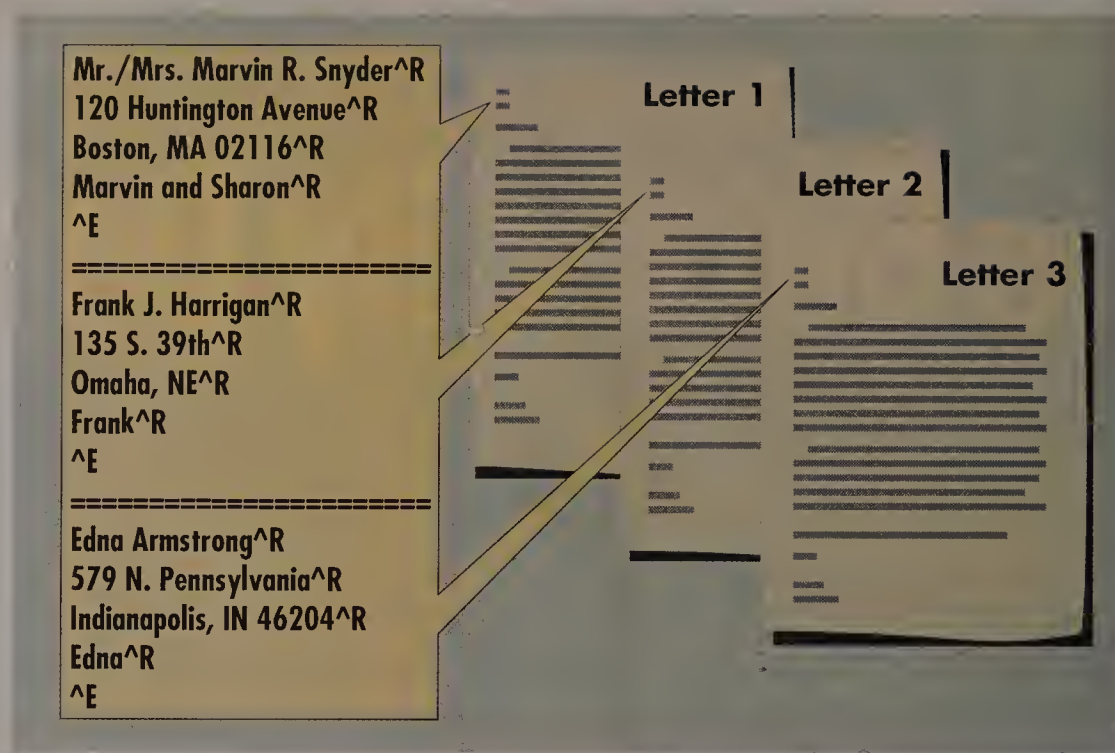

FIGURE 1: When WordPerfect merges a secondary (address) file, it automatically strips out the ^R and ^E merge codes as it inserts addresses in the letters.

Now type the text of the letter, save the primary file to disk as **LETTER.PF**; then clear the screen.

To merge the letter with the addresses, press **<Ctrl>-<F9>** (Merge/Sort) and select choice **1** (Merge). At the Primary File prompt, type **LETTER.PF** and press **<Enter>**. At the Secondary File prompt, type **ADDRESS.SF**. Press **<Enter>**, and the merge will begin.

WordPerfect creates a temporary merge file, and in a moment you'll see the last letter on screen. Print the file, and exit without saving it.

Preparing the Envelope Merge Files

Several factors make merge-printing envelopes tricky: the special format, paper size, and margin instructions.

To create an envelope primary file (ENVELOPE.PF) for use with a LaserJet, you first select the printer: Starting with an empty screen, press **<Shift>-<F7>**, then **S**. (If you have a LaserJet IID, you must also select the sheet feeder.) Then type **3** (Edit) and **4** (Forms) to move on to the forms menu. Use the cursor keys to highlight Envelope 4″ × 9.5″, and press **<Enter>**. (With a LaserJet IID, pick Continuous or bin 5.) To exit the print menus, press **<F7>** (or <Esc>) five times.

Now move to the Format:Page menu to choose the paper type and set top and bottom margins: Press **<Shift>-<F8>** (Format), **2** (Page), and **8** (Paper Size). Type **5** (Envelope 9.5″ × 4″) and **5** (Envelope). Set the top and bottom margins to **1.75** and **1**, respectively.

WordPerfect 5.0 is quirky in that it doesn't let you set all he margins in the same menu. Press **<F7>** to exit to the document window, then move to the Format:Line menu by pressing **<Shift>-<F8>**, **1**, and **7** (Margins). Set the left margin to **3.75** and the right to **2**, then press **<F7>** (or <Esc>) to exit the menu and return to the document.

The next step is to insert the appropriate merge codes into the

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primary file. Insert the codes in the same way as you did for the letter primary file, but omit the salutation line:

^F1^
^F2^
^F3^

Save the file to disk as **ENVELOPE.PF**, and clear the screen.

Merge, and Print the Envelopes

Now merge ENVELOPE.PF with ADDRESS.SF, creating a temporary merge file with a three-line address on each page. To print the file, insert the envelopes face up, flap closed, stamp end first into the far right edge of the manual tray (on LaserJet or LaserJet Plus), in a tray envelope slot (LaserJet II), or in the envelope feeder (LaserJet IID).

If you get a beep when printing this envelope file, cancel the print job and make sure that the Select Printer Forms Envelope is marked both Initially Present (Yes) and Continuous. —*Ralph Blodgett*

Richard Scoville is director of curriculum and development for The Office Works Training Centers in Research Triangle Park, North Carolina. David Bouchard is head of information systems at Metropolitan State University in Minnesota and is president of Age of Information, where he develops microcomputer applications. Michael Robertson is a technical support specialist for Datastorm and manages their technical support area on CompuServe. Ralph Blodgett is the author of WordPerfect 5.0 Power Techniques *(Que Corporation, Carmel, Indiana, 1989) and a WordPerfect Support Group (WPSG) Associate SYSOP on CompuServe. He can be reached at 73767,656.*

USER GROUP TIPS

Helpful hints from members of the nation's user groups

Cloning PC-File Plus Data Base Formats

If several people are entering data into a *PC-File Plus* data base, you may want to check the entries before combining them with the main data base. The process is easiest if each person enters records into an identical format that you can merge with the original data base at the end of the input session. The Merge facility handles the combining phase with ease, but copying the format of an existing data base is a little tricky. *PC-File*'s Clone function is geared toward modifying or copying whole data bases, records and all, so you must fool it into copying a format with no data. To do this, select a data base and press <F8>C to begin cloning it. Follow the program prompts as if you were going to copy all the format information and the data to a new file. Name the clone file, and when the program prompts you to 'Copy All or Selected records', press S twice to select records and start a search. Next, in the first range, enter an invalid selection such as *xxxxx* that you know isn't an existing record. Then, press <F10> to initiate cloning. The invalid field fools *PC-File* into copying the format with no records to a new, empty data base.

Bob Levine
NYPC Users Group

Remove Unwanted Symbols From LaserJet Output

If you use a LaserJet to print a screen from a program such as *Paradox* that uses many on-screen line-draw symbols, you may wind up with foreign-language symbols where the lines should be. That's because the LaserJet's default symbol set, Hewlett-Packard's Roman-8, packs in a multitude of these symbols at the expense of graphics characters. For clean screen printouts, use the IBM-US symbol set instead.

To do so, press the LaserJet's On Line button to take the printer off line. Then hold down the Menu key for about 5 seconds until the LCD display reads 'SYM SET = Roman 8*'. Press the + key until the display reads 'SYM SET = IBM-US'. Next, press the Enter/Reset Menu key to select IBM-US as the new default set; the display marks the new set with an asterisk. Hold down the Continue/Reset key until the message '07 RESET' appears. The printer automatically goes back on line, ready to print your screen's graphics characters. To change back to Roman-8, just repeat the main steps.

Elizabeth Swoope Johnston
LAPALS, The Southern California Paradox Users Group

Chip in! If you're a member of a user group and have tips to share, send them to PC World. *We pay $25 for each published tip. Or if you have a business problem that requires a PC solution, get in touch with our experts. See How to Contact PC World, page 4.* ●

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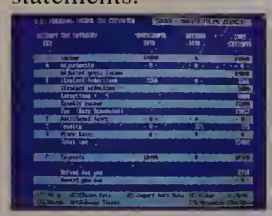

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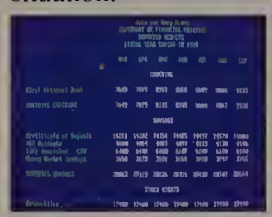

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Accounts Can Be Added When Entering Transactions (Data)	YES	YES	YES	NO
Financial Reports				
Actual Financial Results	YES	YES	YES	YES
Month and Year to Date	YES	YES	YES	YES
All Months On One Report	YES	YES	YES	YES
Budgeted Financial Results	YES	YES	YES	YES
Actual Compared to Budget	YES	YES	YES	YES
Actual Compared to Prior Month	YES	NO	NO	NO
General Ledger Report	YES	YES	NO	NO
Accountant's Trial Balance	YES	NO	NO	NO
Net Worth Computation	YES	YES	YES	YES
Inquiry Reports				
Check and/or Deposit Register	YES	YES	YES	YES
Account Analysis	YES	YES	YES	YES
All Transactions with Party	YES	YES	YES	YES
Cash Requirements Forecast	YES	YES	YES	YES
Aged Invoices Payable	YES	NO	YES	YES
Reports Export to Lotus or Quattro	YES	YES	YES	YES
Graphics	YES	NO	YES	YES
Bar Charts	YES	NO	YES	YES
Pie Charts	YES	NO	YES	NO
Optional Password Protection	YES	YES	NO	YES
Financial Calculator	YES	NO	YES	YES
Prints Amortization Schedules	YES	NO	YES	YES
Prints Accumulation Schedules	YES	NO	YES	YES
Mail List Manager	YES	NO	YES	YES
Prints Address Labels and Index Cards	YES	NO	YES	YES
Prints Telephone Directory	YES	NO	YES	NO
Mail Merge with Word Processor	YES	NO	YES	YES
Check Writer	YES	YES	YES	YES
Prints Laser Checks	YES	YES	YES	NO
Prints Any Pin-Feed Check	YES	NO	YES	YES
Personal Income Tax Estimator	YES	NO	YES	YES
Pop-up Note Pad	YES	NO	YES	YES
Pop-up Math Calculator	YES	YES	YES	YES
Optional Canadian Features				
International Dating	YES	YES	NO	NO
International Terminology	YES	NO	NO	NO
Capacity				
Total Number of Accounts Per File	999	255	**	120
Total Number of Open Transactions	100,000	65,535	**	4,000

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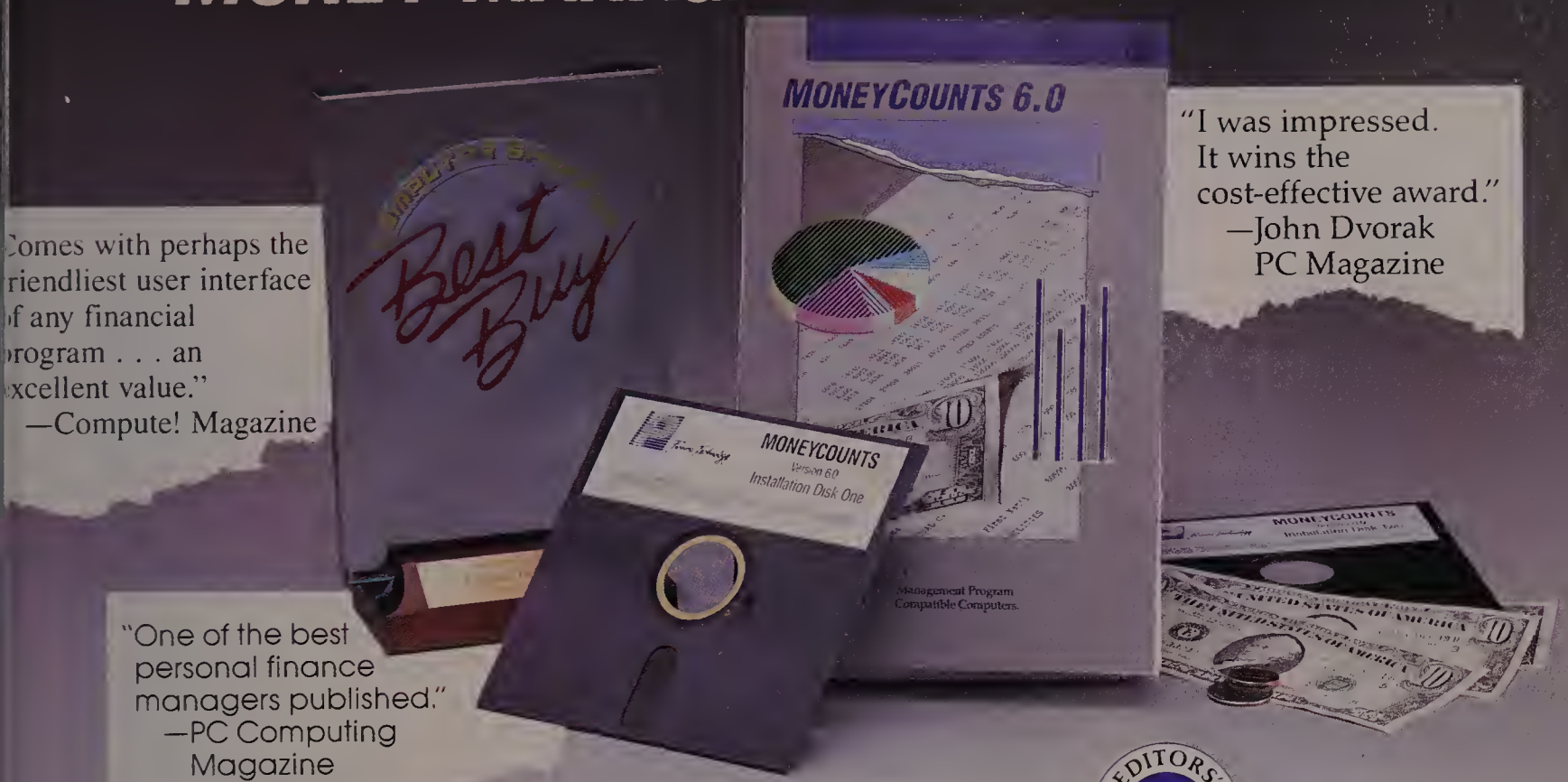

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CONSUMER WATCH

Advice and information for the computer consumer

Managers can—and should—protect their employees from the debilitating effects of repetitive-strain injuries.

Anita Amirrezvani

A Modern Horror Story

In a classic "I Love Lucy" scene, the world's favorite wacky redhead and her sidekick, Ethel, take assembly-line jobs in a chocolate factory. Things work out just fine for the first minute or two, until the assembly line spurts into high gear. Our heroines desperately stuff chocolates into their mouths and down their dresses, but they just can't keep up.

Although the scene is played for laughs, it has a disturbing analogy in the modern computer world, where the pace of work is no joke. More and more workers are complaining of repetitive-strain injuries (RSI), a potentially crippling series of disorders that afflict the muscles, nerves, joints, and tendons. The problem is serious enough in some cases to require workers' compensation: Nearly 20,000 claims for RSI were filed in 1986 in a total of 23 states, according to the Occupational Safety and Health Administration (OSHA).

In the last few years, disturbing clusters of repetitive-strain problems have appeared among employees in computer-intensive environments. At the Mountain Bell phone company in Denver, for example, 180 out of 500 directory assistance operators have filed workers' compensation claims for RSI affecting the hands, arms, and back, according to David LeGrande, occupational health and safety coordinator for the Communications Workers of America. In 1988, OSHA investigated the situation and issued a citation requiring the company to invest in ergonomic furniture; Mountain Bell reportedly has spent $1 million addressing the problem.

Health and safety experts say that the repetitive-strain problem is widely known in industries such as manufacturing, meat cutting, and garment production, where workers must make thousands of nearly identical movements every hour. But it's not as widely recognized in the "safe" world of white-collar work.

With the influx of personal computers, however, white-collar work has changed dramatically. Jobs have become more narrowly defined, especially for clerical employees. The worker who may have had diverse duties including filing, copying, typing, and phone work now sits plastered for 8 hours in front of a video data terminal (VDT).

And compared to typewriters, PCs increase the potential pace of work. They don't jam, don't require a carriage return at the end of each line, don't insist on fresh pieces of paper. As a result, workers' hands can—and do—stay glued to the keyboard. "It's almost because computers

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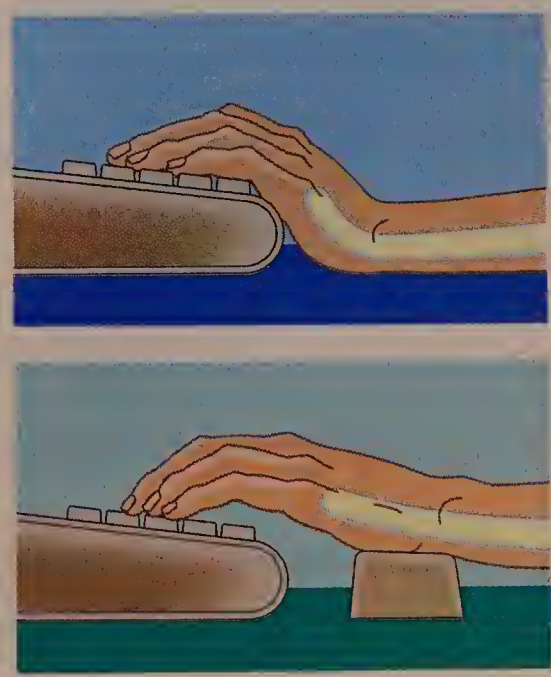


MATTHEW NIELSEN

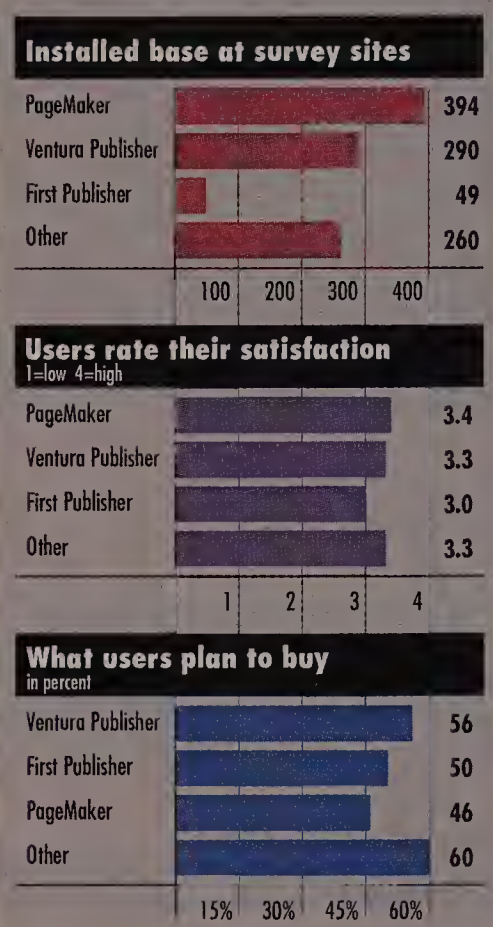
Don't rest your wrists on a desk while typing (top); bending the wrists backward and up puts pressure on the carpal tunnel. Instead, try to keep the wrists straight (bottom); a wrist rest helps with proper positioning.

ANTHONY RUSSO

RATE YOUR SATISFACTION: Desktop Publishing

Two giants, *PageMaker* and *Ventura Publisher*, dominate the expert end of the desktop publishing market; other simpler products, including *First Publisher*, share the rest of the pie with crossover software like *WordPerfect*.

Users say they're more satisfied with feature-rich *PageMaker* and *Ventura* than with easy-to-use *First Publisher*. But that bias hasn't affected purchasing plans: Nearly equal percentages of those surveyed plan to buy at least one of the leading desktop publishing products.



Source: International Data Corporation. From a survey conducted in May 1989 of 175 large organizations, each with at least 50 PCs.

are so efficient that people are having these problems," says Maryann Karinch, communications manager at the Computer Business Equipment Manufacturers' Association.

Despite worrisome health reports suggesting a link between RSI and computer use, few studies have attempted to test the correlation, let alone explain it. Is the problem due to the number of hours worked in front of a PC? The specific motions made? The design of the workstation? The layout of the keyboard? The health of the individual? No one is exactly sure.

But one thing is certain: RSI is potentially crippling if untreated, particularly if a problem called carpal tunnel syndrome develops. The carpal tunnel is formed by the two bones of the wrist; the median nerve, which gives sensation to the hand, passes through this tunnel. If the wrists are twisted or bent at unnatural angles for long periods of time, the nerve can become irritated and inflamed. Severely afflicted workers report being unable to grab a doorknob, pick up a sheet of paper, or even shake hands without severe pain. Advanced cases require surgery and months of rest.

Clearly it's important to nip the problem in the bud. Managers should, at a minimum, provide well-designed, adjustable workstations and educate workers about the need for breaks. "Employers who resist making any changes are going to end up with an albatross around their neck," predicts Sharon Danaan, research director for 9 to 5, a lobbying group for clerical workers.

The first step is to reduce the likelihood of problems by using ergonomically sound workstations. Guidelines approved by the American National Standards Institute are available for $25 from The Human Factors Society, Box 1369, Santa Monica, CA 90406.

Most experts agree that work practices, including sufficient breaks that allow the muscles to stretch and relax, are equally important. "Seated work at a terminal is physical work; it involves muscle activity that can be stressful," points out Dr. Marvin Dainoff, director of the Center for Ergonomic Research at Ohio's Miami University and author of *People and Productivity: A Manager's Guide to Ergonomics in the Electronic Office* ($36.95 from MDA Books, 8606 Empire Ct., Cincinnati, OH 45231). "Employees should be told that they will get muscle strain from doing anything too long in the same posture."

Regulations for computer workers in Suffolk County, New York, the first in the United States to include private sector employers, require a 15-minute break every 3 hours. The National Institute of Occupational Safety and Health recommends breaks every 2 hours, or more often if needed.

Some managers recommend tactics that discourage employees from staying too long at their PCs. Dorothy Paleologos, director of people and technology services for Aetna Life & Casualty, says her company tries to design variety into clerical work. In Aetna's payroll department, for example, data entry jobs have been combined with other types of work so that no one spends more than 70 percent of the workday at the PC. "Morale and productivity have actually improved," says Paleologos. Aetna is a founding member of the Center for Office Technology, an organization that favors self-regulation by business over legislative

(continues)

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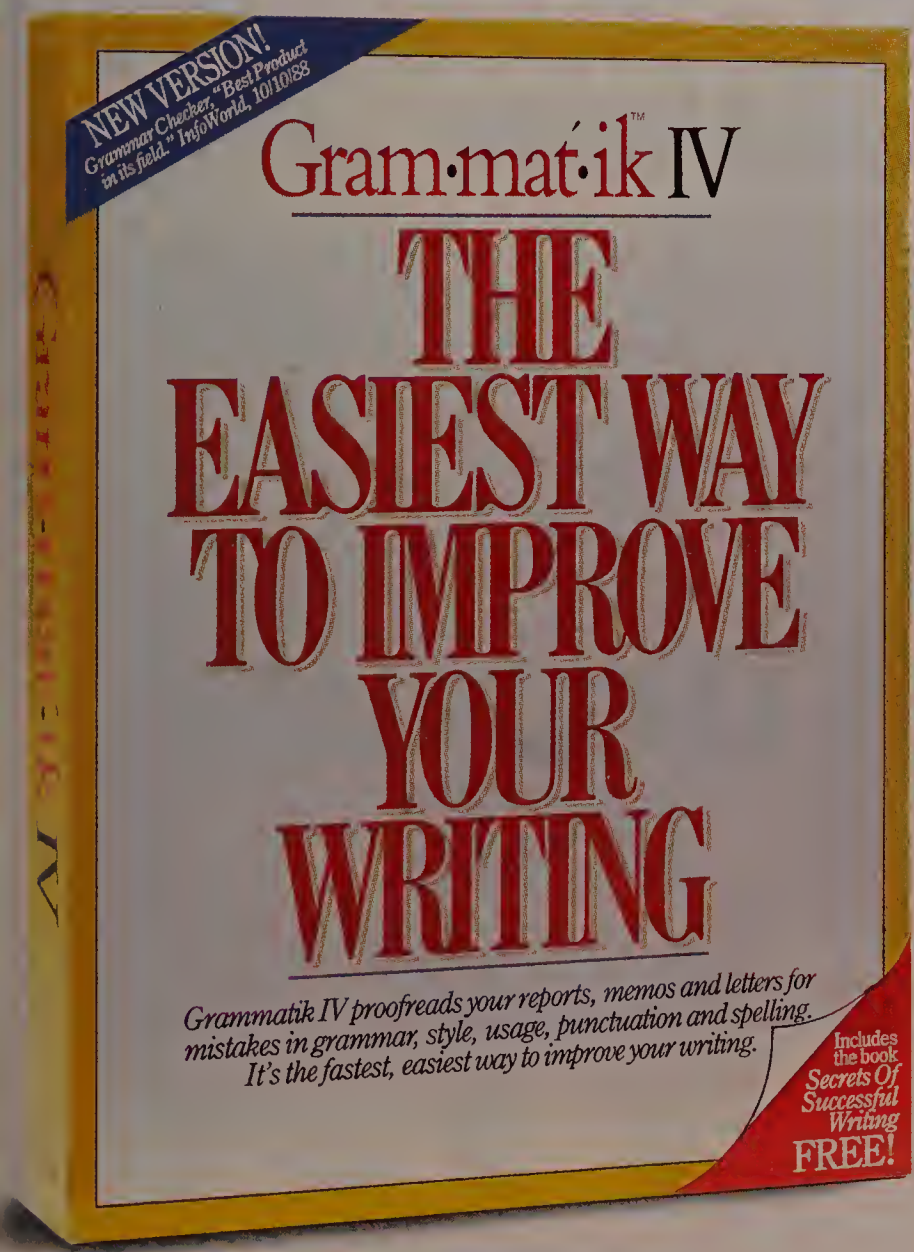

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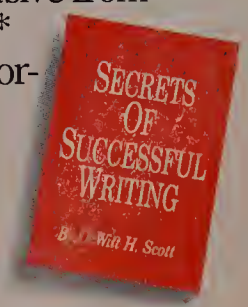

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efforts to improve the conditions of workers who use PCs.

But even if the initiative doesn't come from management, individuals can help themselves by monitoring their work posture. During keyboard use, make sure that the wrists are straight—not bent backward, forward, or sideways. The fingers should be poised over the keys as over a piano; wrists should not be resting on the desk. Wrist rests (thick rolls of foam, available for about $30) can help with proper positioning.

Any pain or discomfort should be addressed immediately. In *Improving VDT Work* (available from the Report Store, 123 W. 8th St. #214, Lawrence, KS 66044; 913/842-7348), author Steven Sauter recommends a simple test: Put your elbows on a table, and let your wrists dangle loosely for about a minute. If you feel pain in your hands, you may be on your way to problems. Don't wait until the trouble gets worse—see a doctor right away.

SHOP TALK

High on Relativity

I was shocked to read the letter in your May issue about Video Seven. My experience has been exactly contrary to Mr. Yablonsky's (see "Slow Support at Video Seven," *Consumer Watch*, May 1989).

After purchasing a Vega VGA board, I had problems using it with a Zenith 1490 monitor and an AST/Premium 386. From the first time I called Video Seven's toll-free technical support number, I was treated like a king. I sent them my card for a fix, and they sent me a replacement via Federal Express so I wouldn't be without the use of my computer. Over the next four months, they worked with me to solve problems and sent me an updated chip on at least three occasions.

I often call their support numbers and have had nothing but pleasant experiences. The only change I've noticed in the last two months is that you have to wait 5 or 10 minutes to get through, which you did not have to do a year ago. However, I use a lot of software, and this is cer-

(continues)

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tainly well below the normal waiting times that I experience.

All of Video Seven's boards come with a card that says "compatibility absolutely guaranteed." Based on my experience, the company backs this guarantee up.

Ira M. Thomas
Memphis, Tennessee

From One Bad Thing to Another

I feel I've gotten a raw deal. In December 1988 I purchased a Priam ID-62 hard disk drive for my PS/2 Model 80. Installing the drive and connecting the cables was no problem. However, when I powered up the machine, the drive didn't respond at all. I called Priam; the support person suspected a bad power cable. When I followed his suggestion to switch power cables between my existing drive C: and the new drive, disaster struck. Drive C: died also.

At that point I brought the whole machine back to 47th Street Computer, where I had bought the drive, for repairs. They refunded my money for the drive but refused to pay for drive C:. Same with Priam, which also denied giving the advice that caused the damage in the first place. I ended up paying more than $1000 to replace my drive. I feel Priam should pay for this.

James Gordon
Jersey City, New Jersey

Priam responds: Our warranty covers only our own equipment, not damages to any other equipment. This is a standard warranty policy offered by most hardware manufacturers.

Because the Priam drive was purchased and returned in 1988, we no longer have records to verify the nature of Mr. Gordon's failure. It is extremely unlikely that a bad cable could cause such a problem. And it is not recommended to test a malfunctioning cable with good equipment.

However, we feel that Mr. Gordon's service and warranty return may have been handled improperly. We have contacted his dealer and will provide credit or payment for his service bill.

Kevin Gardner
Marketing Program Manager

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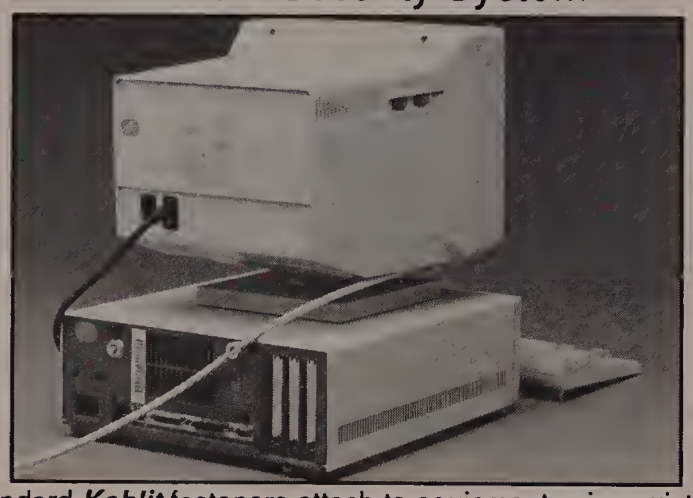

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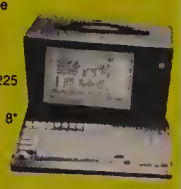

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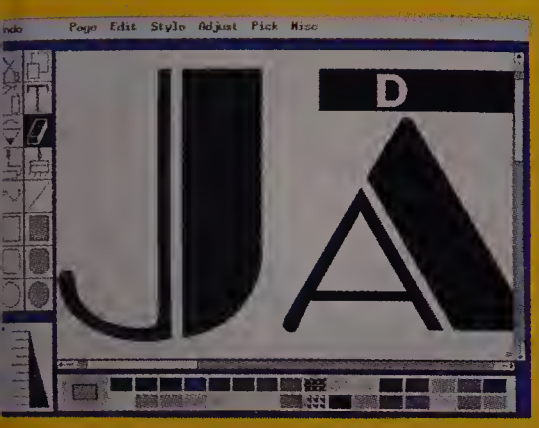

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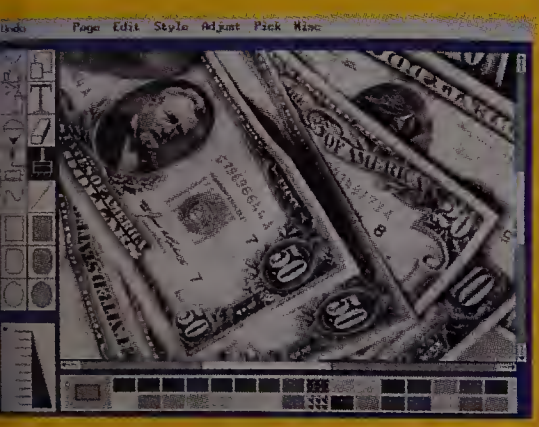

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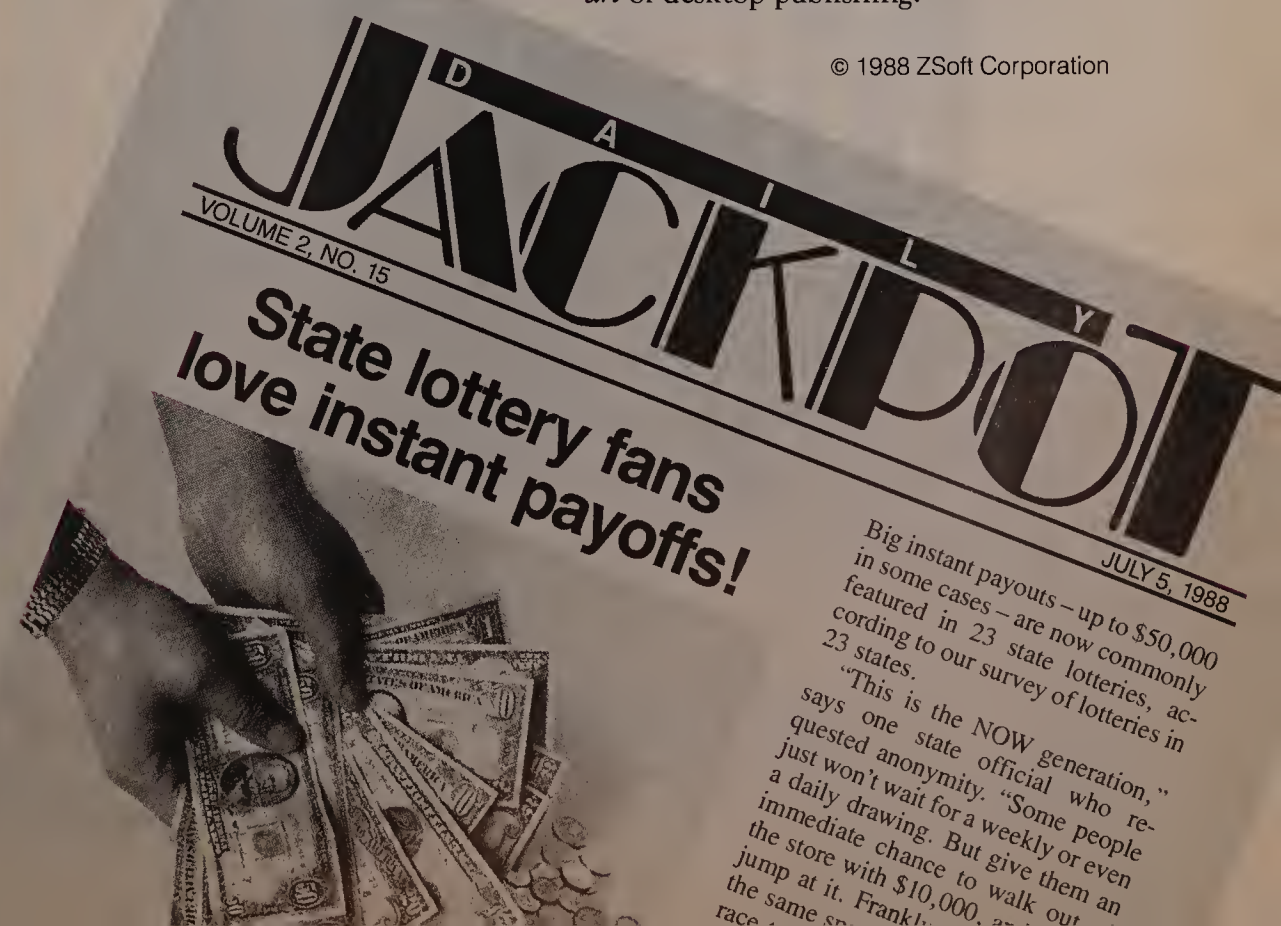

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PC WORLD

Where's the Extra Boost?
I purchased an Orchid Twin Turbo board because it promised to speed up my XT to 12 MHz. This acceleration is achieved with "booster" boards that are included with the main product. To my disappointment, the boosters failed to function properly. According to Orchid technical support, nothing could be done about this problem without an expensive alteration to my motherboard. The Orchid personnel kept reminding me that even without the booster, the main board still gives you superior speed. That's true, but I wanted 12-MHz operation.

Wayne G. Rogers
South Russell, Ohio

Orchid responds: We have investigated Mr. Rogers' case, and I can report that we have replaced the product for him on three separate occasions between April 1988 and February 1989. It is Orchid's policy to replace rather than repair products, because this causes less delay. On each occasion the board was tested for 24 hours prior to shipping. Our technical support specialists personally tested the products, due to Orchid's inability to recreate Mr. Rogers' problems.

Martin Soble
Senior Vice President
Marketing and Sales

Take action! If you've got a complaint or a compliment, send it to Consumer Watch. *We'll follow up and publish letters with the broadest interest. For more information, see How to Contact PC World, page 4.* ●

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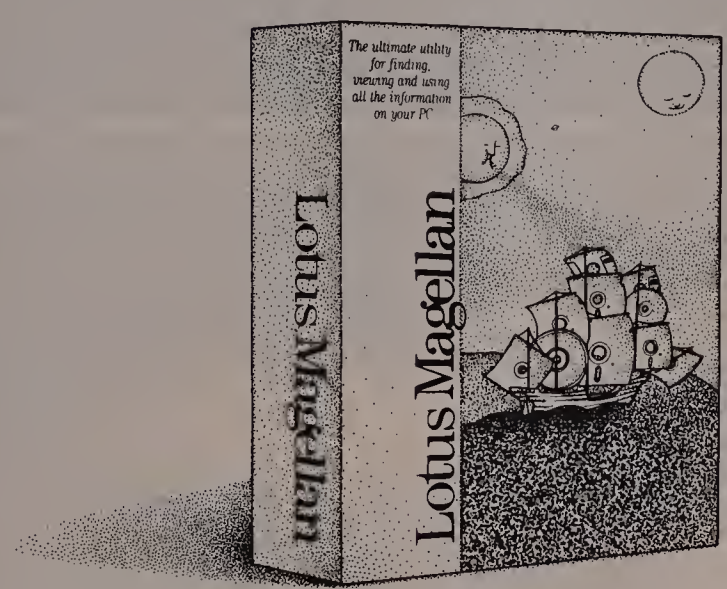

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If you're thinking of putting an IBM monitor on your PS/2, you're not seeing the big picture.

When it comes to displays, bigger is better. That's one reason why the Amdek Monitor/432 monochrome VGA has a big edge over IBM's own standard PS/2 monitor.

But it's not the only reason. Because the 432 is, after all, from Amdek. A company with over 12 years experience in the computer monitor business, and the leading independent monochrome supplier.*

The 432's 14" etched-surface, flat screen produces hardly any glare or distortion. And far less eyestrain than Big Blue's PS/2 monitor with its smaller, 12" curved screen.

What's more, IBM's smaller screen also carries a bigger price tag.

So, if you're choosing a monochrome monitor for a PS/2 or any AT compatible, remember the company that hasn't lost sight of the big picture. Amdek. For the dealer nearest you, call 1-800-PC AMDEK.

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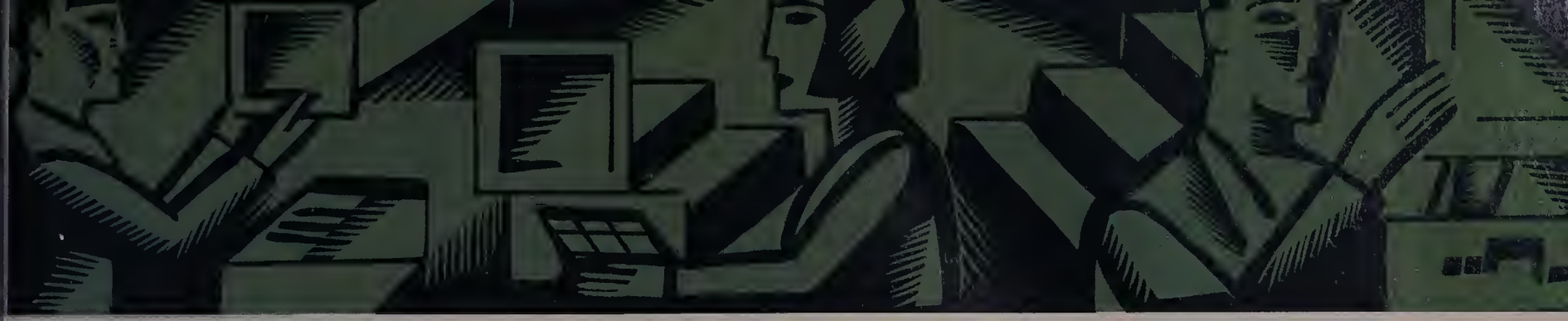


THE UPGRADE PATH

Hands-on advice for upgrading PCs, compatibles, and peripherals

Turn the LaserJet into a plotter, protect your PC with an internal UPS, and more.

Edited by Robert Luhn

Fiendishly Clever Plot

Time and money are always in short supply. Unfortunately, you need lots of both if you want sharp plotter output for your CAD or business graphics package. Capable plotters not only start at $1300 but are as slow as snails on Sominex. One solution is to turn your laser printer into a plotter with a software emulator such as Insight Development's $199 *PrintAPlot*. But software emulators aren't particularly fleet. A better solution is Pacific Data's Plotter in a Cartridge, which turns your LaserJet Series II or Canon LBP-811 into a speedy HP 7470A, HP 7475, or HP ColorPro plotter with no fuss.

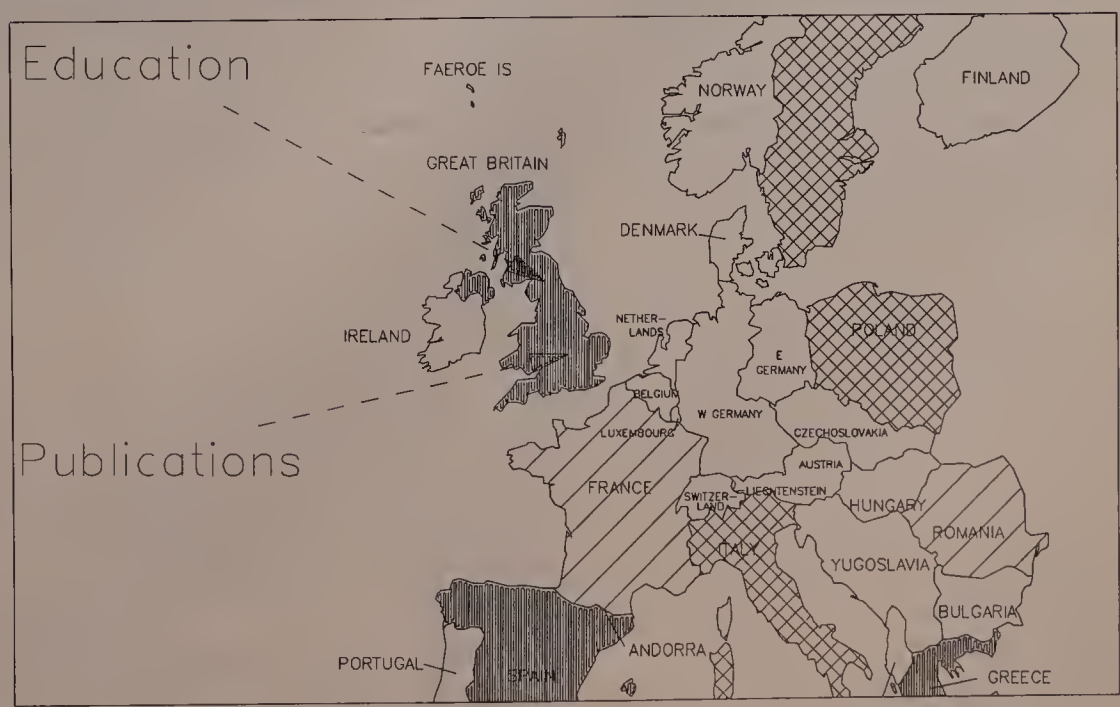
Just plug the $395 cartridge into a LaserJet Series II or Canon LBP-8II with 1.5MB of RAM, and you can churn out crisp gray-scale diagrams and characters. You don't even have to struggle with drivers—if your graphics package is installed for one of the plotters the cartridge emulates, you can print away.

Installation is a snap. Turn off the printer, slip the cartridge into the left slot, turn the printer back on, and send plots from your favorite application. Need to print a letter? Exit to DOS, run Pacific Data's supplied utility, and the laser printer assumes its old personality. To return to plotting, just run another utility, and you're in business. Pacific Data hasn't certified the Plotter in a Cartridge for networked laser printers, but I had no problems sending plots over an *Advanced NetWare/286* LAN.

Plotter in a Cartridge has speed and sharp output in its favor, but it won't replace plotters just yet. You can't generate color output, of course, and users of the LaserJet, LaserJet Plus, LaserJet IID, and clones are left out of the game. What's more, even the standard LaserJet II doesn't support the cartridge; you need at least 1.5MB of printer memory. Finally, though the cartridge works on a network, you must make sure nobody prints a file during an emulation or while you're switching the printer from one mode to the other.

A plotter it ain't, but Plotter in a Cartridge is easy to use,

(continues)



The Plotter in a Cartridge lets your laser printer spit out detailed black-line plots like this one, created with Freelance Plus.

ANTHONY RUSSO

produces top-notch output, *and* saves time—and that makes it worth the price. —*Matt Lake*

WHERE TO BUY

Plotter in a Cartridge
Pacific Data Products
6404 Nancy Ridge Dr.
San Diego, CA 92121
619/552-0880, 619/552-0889 (fax)
LIST PRICE: $395
REQUIREMENTS: 1.5MB of printer memory, Canon LBP-8II or HP LaserJet II
WARRANTY: one year parts and labor
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: unlimited, no toll-free number, M–F 8–5
OTHER SUPPORT: none
Reader service no. 605

The Fully Power-Protected PC

Worried about your PC, bunky? Do you always make sure your computer is plugged into a grounded outlet? Does the thought of a power failure give you palpitations?

Put away those tranquilizers and read on. If your data and hardware are just too valuable to risk, it's time to get an uninterruptible power supply, or UPS. Unfortunately, many UPS's start at $1000 and take up precious desktop real estate. But Arrick/Microsync's $299 internal Boomerang UPS not only saves money and desk space but rescues your data when the lights go out unexpectedly.

Like most UPS's, when the Boomerang detects a power loss—due to a downed power line or a kicked-out power cord—its battery-driven power supply takes over and keeps your PC running, while special software saves any open files in memory to disk. Unlike most UPS's, the Boomerang fits inside your PC, interposed between the power supply and the motherboard. Better still, the Boomerang will automatically save the contents of a RAM disk, return you to where you were in an application when the power died, and even park your hard disk's heads. Another big plus: The Boomerang comes with a 30-day money-back guarantee.

There may be times when you're tempted to use this guarantee. Installing the Boomerang means juggling the 4-by-5-by-1½-inch unit from one hand to the other as you fuss with stiff power cables, attach alligator clips, and somehow cram the UPS between the PC's power supply and last slot. Although the company touts the Boomerang's "slotless" installation, expect to kiss two slots goodbye on a PC or XT, and one slot on an AT. Installation isn't made any easier by a user manual that omits some key illustrations and directions.

The first step toward power protection is running Arrick's menu-driven install program. Slip the supplied utility disk into drive A:, type BINSTALL, answer various prompts (press <F10>, not <Enter>, to confirm choices), and the necessary files are copied to disk and AUTOEXEC.BAT and CONFIG.SYS are modified. Log on to the newly created BOOMERAN subdirectory, and you'll discover from one to three files: for saving data stranded in system and video memory, expanded memory, and extended memory. Reboot the system, and Arrick's copyright message pops up, followed by the Boomerang menu. Select '<S> Start Boomerang', and 'Boomerang started' should appear.

Now comes the fun part. Park your PC's hard disk, turn off the system, remove all external cables, and slide the system cover off. At the back of the PC, locate the two white power supply connectors that are attached to the motherboard, and gently pull them out. On IBM machines and many clones, the keyed plugs are labeled P8 and P9, but note their position for later reference just in case. Remove any expansion boards in the last two slots—you'll need the space for the Boomerang.

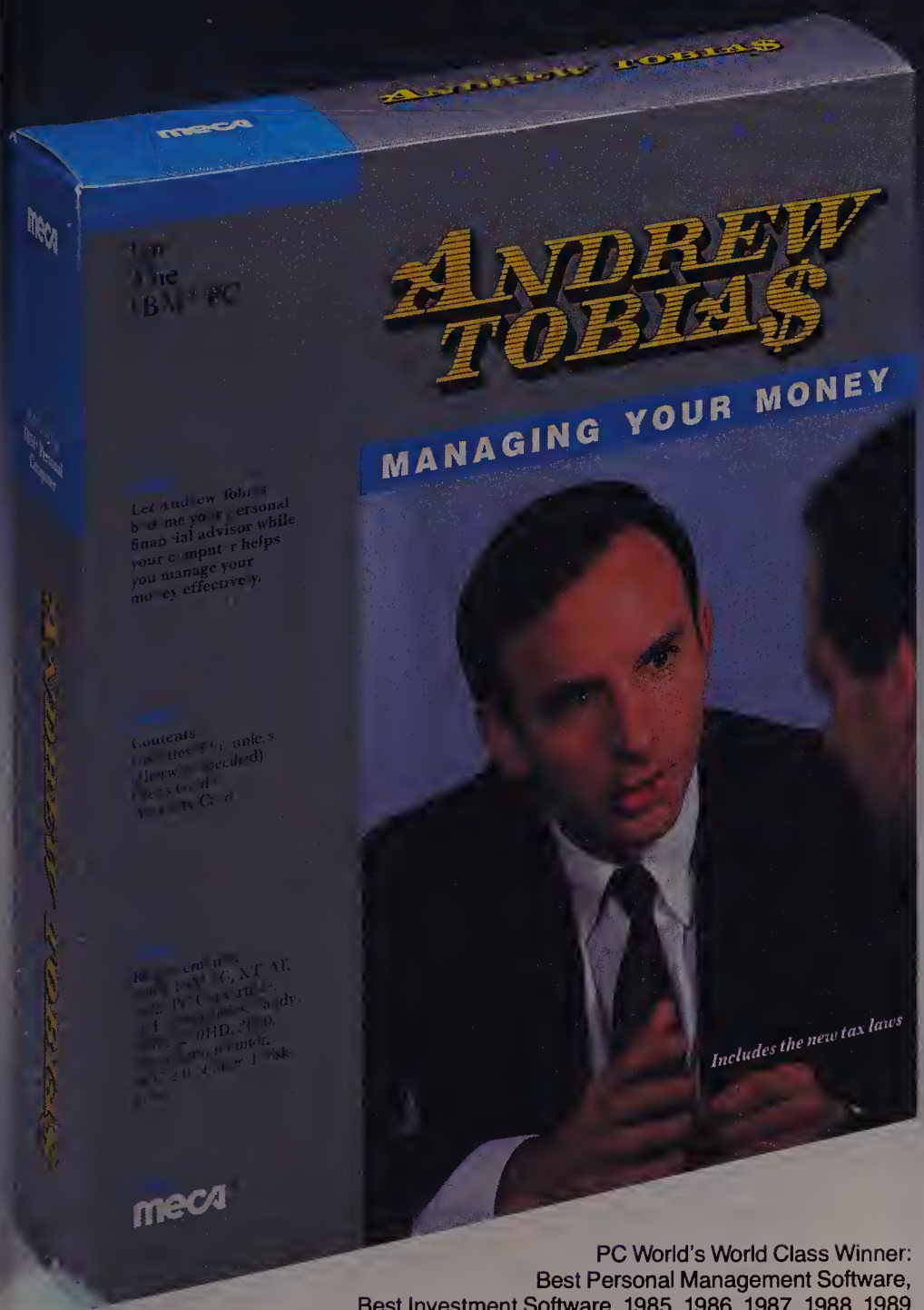
Installing the Boomerang essentially involves connecting the PC's power supply to the Boomerang and the Boomerang to the motherboard. Take the Boomerang out of its antistatic packaging, and hold it with the green circuit board on the bottom and the "BATTERY CAUTION" sticker on top. Follow the manual's instructions and stick the Boomerang's alligator clip in the hole behind pin A1 of the closest expansion slot. Next, bend the PC's dangling power supply connectors out of the way and gently plug the Boomerang's keyed white power connectors into the now-vacant motherboard sockets. Then plug the PC's power connectors into the waiting sockets on the Boomerang.

At this point, you're supposed to slip the Boomerang into the space between the power supply and last slot, secure the unit's mounting bracket to the PC's backplane, and reinstall the two expansion boards you removed earlier. Unfortunately, the PC's and Boomerang's power cables are too thick and stiff to permit doing so. If you're deft, you may end up covering only one slot; this experienced upgrader obscured two.

If you can live without two slots, the Boomerang is a god-

(continues)

THE FINANCIAL POWER YOU NEED TO SUCCEED ...MADE SIMPLE.



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send. When that dreaded blackout strikes—or you mistakenly turn your PC off—you'll notice that the PC's fan is still rumbling and that the hard disk is working like mad. When the Boomerang has saved all your stranded data to disk, it beeps and shuts the computer down. Turn on the PC later when AC power is available, select Restore from the Boomerang utility menu, and you'll be back at your previous place, your data intact.

The Boomerang isn't a painless upgrade, and it doesn't cover all the bases. Although it's an on-line UPS and provides some line conditioning, it can't cope with the kinds of power surges a nearby lightning strike creates. Note, too, that although the Boomerang can rescue data from almost any application, from *dBASE* to *Windows/286*, currently it doesn't support LAN applications, OS/2, *Windows/386*, *Desqview/386*, or UNIX. If your system holds megabytes of RAM, you may also need a second battery.

But these are quibbles—especially for a $299 unit. If protecting your data is paramount and your budget's tight, the Boomerang is a must. —*R. L.*

WHERE TO BUY

Boomerang
Arrick/Microsync Computer Products Inc.
2107 W. Euless Blvd.
Euless, TX 76040
800/543-0161, 817/540-0938
LIST PRICE: $299, additional batteries $47.95
REQUIREMENTS: 256K; hard disk; DOS 2.1 or later version; PC, XT, AT, 386, or compatible
WARRANTY: 30-day money-back guarantee, one year parts and labor
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: unlimited, toll-free number, M–F 8–5
OTHER SUPPORT SERVICES: none
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Happy Trails

As of this issue, *The Upgrade Path* closes up shop—but will be reopening in a new location. Starting with our January 1990 issue, we'll be covering upgrades in our "How To" section. So if you have upgrade questions or requests, send them to Upgrades c/o PC World. Please see How to Contact PC World, page 4, for details. —*R. L.* ●

Matt Lake is an editorial assistant for PC World.

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Of course, these are just a few opinions, but we'd say there's a definite trend here.

We'd like to thank the thousands of PC World Magazine readers who voted TurboTax the best Tax Planning and Preparation program for four years in a row.

TurboTax may be so popular because we designed it to be incredibly fast and powerful, yet extremely easy to use.

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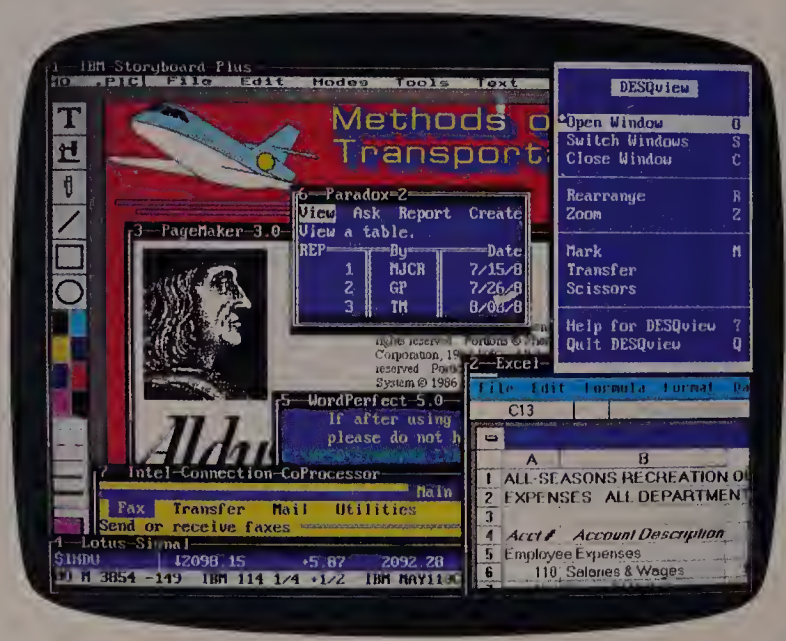

DESQview lets you run your favorite programs in windows side-by-side.

Introducing DESQview 386

For users of 80386 PCs and PS/2s (or PCs with 80386 add-in boards, such as the Intel Inboard 386), there's DESQview 386 (a combination of DESQview 2.2 and the new QEMM-386 Quarterdeck Expanded Memory Manager, version 4.2).

DESQview 386 gives you extraordinary power. Run text, CGA, EGA, VGA, and Hercules programs in windows and in the background. Run 32-bit 386 programs, like Paradox 386, and IBM Interleaf simultaneously with your favorite DOS programs. All with the speed and performance you expect out of your 386. And with protection against 'misbehaved' programs.

Promise and performance

And, of course, both DESQviews have all the features that made prior versions the popular choice in operating environments. The ability to multitask in 640K and beyond. View programs in windows or full screen. Transfer data. Access DOS via menus. Dial your phone. And create keystroke macros within and between programs.

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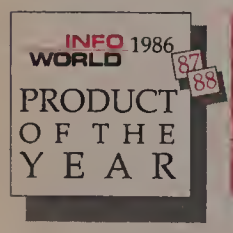

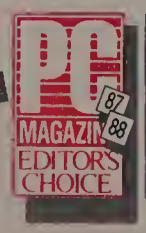

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Edited by Tom Swan

ANTHONY RUSSO

Putting <Scroll Lock> to Work

I've often wondered why my PC's <Scroll Lock> key was put there, since it doesn't seem to do anything. So I wrote SCROLOCK to put this do-nothing key to work. Now when <Scroll Lock> is on, my display pauses during long DIR listings and TYPE commands. To scroll to the next page of text, I just hit any noncharacter key such as <Ctrl>, <Alt>, or <Shift>. When <Scroll Lock> is off, the display scrolls normally.

SCROLOCK works with most other software that scrolls the display. Unlike the MORE command, it doesn't display a message. The screen scrolls as soon as you press a key; for rapid scrolling, just tap <Alt> repeatedly.

To install the program, copy SCROLOCK.COM to any directory referenced by your AUTOEXEC.BAT file's PATH command, and add the command SCROLOCK 25 ON to AUTOEXEC.BAT.

The default number of display lines (25) and setting (ON) are optional. Increase 25 if your screen can display more lines. Remove ON if you don't want <Scroll Lock> turned on automatically. Because the program remains resident until you reboot, don't issue this command more than once, or you'll load multiple copies of SCROLOCK into RAM.

Clifford J. Vander Yacht
Jacksonville, Florida

(continues)

```
1000 DATA "scrolock.com"
1010 DATA 1,E9,00,01,FB,1E,06,50,53,51,50,B8,40,00,8E,C0,58,-1,7B
1020 DATA 2,0E,1F,26,F6,06,17,00,10,74,1B,80,FC,00,74,20,3D,-1,9F
1030 DATA 3,00,06,74,1B,3D,01,06,74,23,80,3E,E9,00,02,74,05,-1,7C
1040 DATA 4,80,FC,02,74,34,59,5B,58,07,1F,2E,FF,2E,E4,00,A0,-1,A7
1050 DATA 5,EA,00,A2,E8,00,C6,06,E9,*2,EB,E9,83,F9,00,75,-1,FD
1060 DATA 6,E4,A0,EA,00,3A,F0,75,DD,FE,06,E8,00,C6,06,E9,00,02,-1,5E
1070 DATA 7,38,06,E8,00,77,FA,EB,CC,26,3A,3E,62,00,75,C5,8A,-1,05
1080 DATA 8,DF,2A,FF,D1,E3,26,8B,8F,50,00,3A,2E,EA,00,75,B4,-1,7E
1090 DATA 9,0A,D2,75,B0,3A,36,EA,00,75,AA,0A,C9,74,05,C6,06,-,05
1100 DATA 10,E9,*2,F6,16,E9,00,80,3E,E9,*2,74,96,FE,06,-1,B1
1110 DATA 11,E8,00,38,06,E8,00,76,8C,B4,02,26,8A,3E,62,00,9C,-1,F9
1120 DATA 12,FF,1E,E4,00,A0,EA,00,EB,A7,50,E4,60,A8,80,75,27,-1,49
1130 DATA 13,53,51,52,06,B8,40,00,8E,C0,26,8A,1E,62,00,2A,FF,-1,05
1140 DATA 14,D1,E3,26,8B,97,50,00,2E,8A,26,EA,00,2A,E6,2E,88,-1,13
1150 DATA 15,26,E8,00,07,5A,59,5B,58,2E,FF,2E,E0,00,53,43,52,-1,2C
1160 DATA 16,4F,4C,4F,43,4B,20,69,6E,73,74,61,6C,6C,65,64,0D,-1,1B
1170 DATA 17,0A,24,BE,81,00,2B,DB,AC,3C,0D,74,2A,3C,30,72,F7,-1,42
1180 DATA 18,3C,39,76,14,24,DF,3C,4E,75,ED,1E,B8,40,00,8E,D8,-1,C2
1190 DATA 19,80,0E,17,00,10,1F,EB,DF,2C,30,D0,E3,02,C3,D0,E3,-1,F4
1200 DATA 20,D0,E3,02,D8,EB,D1,0A,DB,75,02,B3,19,FE,CB,88,1E,-1,BE
1210 DATA 21,EA,00,C6,06,E8,*2,C6,06,E9,*2,B8,09,35,CD,-1,B8
1220 DATA 22,21,89,1E,E0,00,8C,06,E2,00,BA,BA,01,B8,09,25,CD,-1,FB
1230 DATA 23,21,B8,10,35,CD,21,89,1E,E4,00,8C,06,E6,00,BA,03,-1,98
1240 DATA 24,01,B8,10,25,CD,21,BA,EE,01,B4,09,CD,21,B4,49,8E,-1,06
1250 DATA 25,06,2C,00,CD,21,BA,1F,00,B8,00,31,CD,21,-1,61,-1
```

LISTING 1: Merge these DATA lines with X-MAKER2.BAS (LISTING 2) to create SCROLOCK.COM using BASIC.

```
10 DEFINT A-Z:CLS:KEY OFF:DEF FNHEX(X$)=VAL("&h"+X$)
20 MSG$="Now testing for data errors...please wait" : GOSUB 190
30 SUM=0:READ LN:IF LN<0 THEN 80
40 READ H$:IF VAL(H$)<0 THEN 70
50 IF LEFT$(H$,1)="*" THEN GOSUB 210 : GOTO 40
60 SUM=(SUM+FNHEX(H$))*2:SUM=(SUM\256)+(SUM MOD 256):GOTO 40
70 READ CKSUM$:IF (SUM MOD 256)=FNHEX(CKSUM$) THEN 30 ELSE GOTO 170
80 MSG$="Press any key except ESC to create "+F$+": "
90 GOSUB 190 : A$=INPUT$(1) : PRINT : IF A$=CHR$(27) THEN END
100 LOCATE 6,1:PRINT "Working...";
110 OPEN F$ AS #1 LEN=1 : FIELD #1,1 AS BX$
120 READ LN:IF LN<0 THEN 160
130 READ H$:IF VAL(H$)<0 THEN READ CKSUM$:GOTO 120
140 IF LEFT$(H$,1)="*" THEN GOUB 240 : GOTO 130
150 LSET BX$=CHR$(FNHEX(H$)) : PUT #1 : GOTO 130
160 CLOSE:PRINT:PRINT F$;" has now been created.":END
170 PRINT:PRINT "Error in DATA line";STR$(LN);".";
175 PRINT:PRINT "SUM=";SUM
180 PRINT "Check your work.":BEEP:END
190 CLS : LOCATE 3,1 : PRINT "X-Maker II" : RESTORE : READ F$
200 LOCATE 5,1,1 : PRINT MSG$; : RETURN
210 ZZ=VAL(MID$(H$,2)) : FOR I=1 TO ZZ
220 SUM=SUM*2 : SUM=(SUM\256)+(SUM MOD 256)
230 NEXT : RETURN
240 ZZ=VAL(MID$(H$,2)) : FOR I=1 TO ZZ
250 LSET BX$=CHR$(0) : PUT #1 : NEXT : RETURN
```

LISTING 2: X-MAKER2.BAS, Star-Dot-Star's program-making program.

```
* MENU.PRG

PROCEDURE MENU
PARAMETERS OPTION, NUMOPT
PRIVATE DONE, KOUNT, MAXCHCLEN
DONE = .F.
KOUNT = 1
MAXCHCLEN= 0
OPTCOL = 0
* Find length of the longest option parameter
DO WHILE KOUNT <= NUMOPT
    SUB = STR(KOUNT,1)
    IF LEN(OPT&SUB) > MAXCHCLEN
        MAXCHCLEN = LEN(OPT&SUB)
    ENDIF
    KOUNT = KOUNT + 1
ENDDO
OPTCOL = (INT((79-MAXCHCLEN)/2))
* Display menu options
KOUNT = 1
@ 2, 0 CLEAR
@ 2, 0 TO 4,79 DOUBLE
@ 3,(INT((79-LEN(OPTHEADER))/2)) SAY OPTHEADER
@ 6, 0 TO (9+NUMOPT),79 DOUBLE
DO WHILE KOUNT <= NUMOPT
    SUB = STR(KOUNT,1)
    @ (7+KOUNT),OPTCOL SAY OPT&SUB
```

(continues)

LISTING 3: MENU.PRG displays stylish dBASE menus.

Editor's note: To create your own copy of SCROLOCK.COM, add the lines from **LISTING 1** *to the end of* **LISTING 2** *(X-MAKER2-.BAS,* Star-Dot-Star's *program-making program). Run the result using your favorite BASIC compiler or interpreter. To test SCROLOCK.COM, install the program, then TYPE a long text file with <Scroll Lock> first on, then off.*

Stylish dBASE Menus

There's nothing like a stylish menu to add a touch of class to *dBASE* programs. I use the procedure MENU.PRG [see **LISTING 3**] to let users select highlighted menu commands by pressing <Cursor Up> or <Cursor Down> and then hitting <Enter>. MENU.PRG also lets you select a command by typing its number.

The biggest advantage, of course, is that MENU.PRG eliminates the need to create a custom interface for every *dBASE* application you write. To wrap menus around any application, you essentially insert into your program variables that MENU-.PRG recognizes. MAIN.PRG [see **LISTING 4**] is a shell that demonstrates how another *dBASE* program calls MENU.PRG.

MENU.PRG can accept as many as nine menu options stored in public variables OPT1 through OPT9. It requires a title (such as 'MAIN MENU') for OPTHEADER and two parameters: OPTION, which holds the user's selection, and NUMOPT, which equals the number of user choices. MENU.PRG draws boxes around the centered title and commands, displays instructions, and highlights selections.

Vincent D. O'Connor
Babbitt, Minnesota

(continues)

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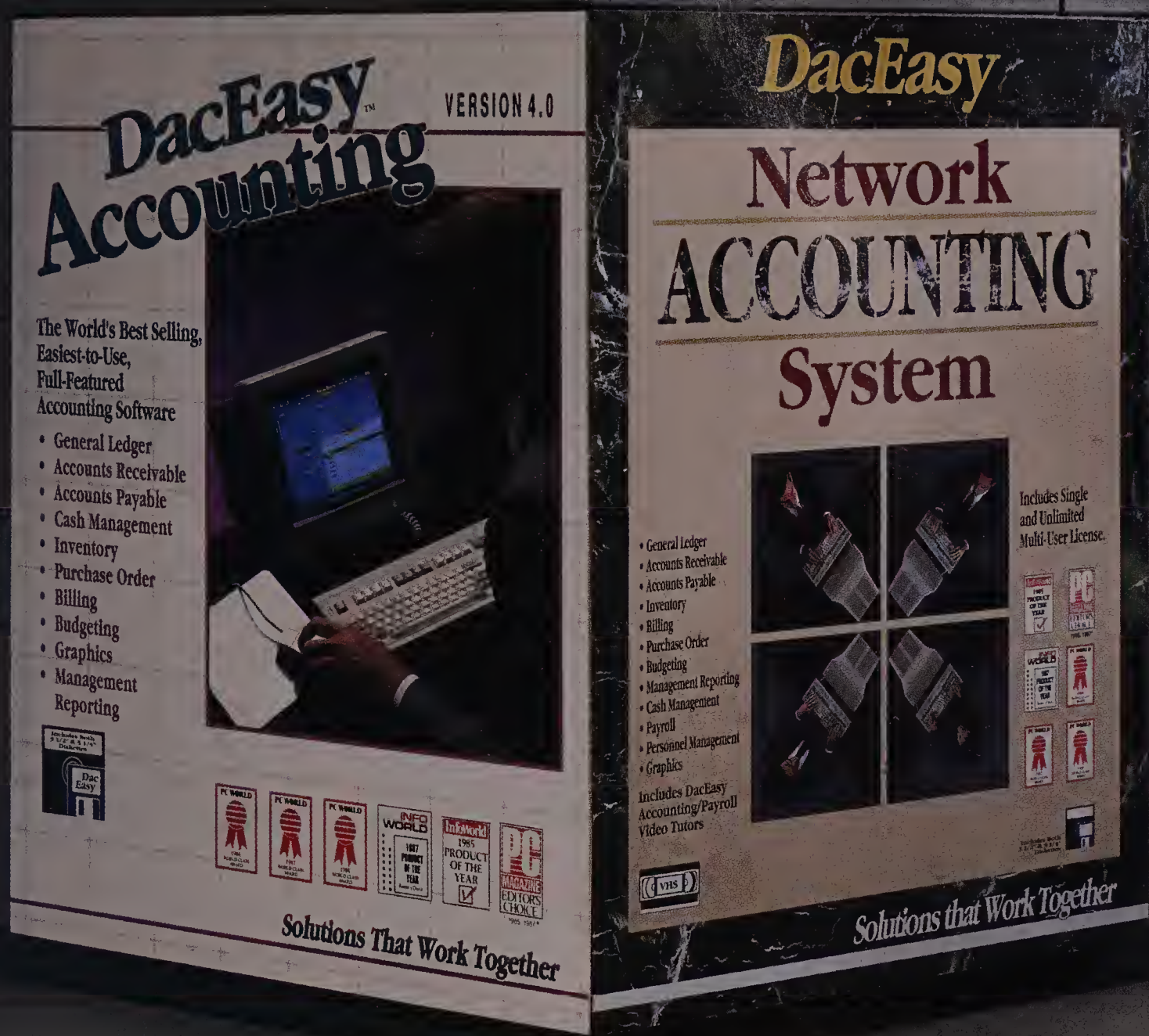

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```
    KOUNT = KOUNT + 1
ENDDO
* Display instructions
@ (10+NUMOPT),0 TO (13+NUMOPT),79 DOUBLE
@ (11+NUMOPT),18 SAY 'Highlight option by using'
@ (11+NUMOPT),44 SAY CHR(24) + ' or ' + CHR(25);
    + ' and press ' + CHR(17) + CHR(217)
@ (12NUMOPT),22 SAY 'or select a number.'
OPT = 1
SUB = STR(OPT,1)
KEYPRESS = 0
OPTION = 0
@ (7+OPT),OPTCOL GET OPT&SUB
CLEAR GETS
DO WHILE .NOT. DONE
    KEYPRESS = 0
    DO WHILE KEYPRESS = 0
        KEYPRESS = INKEY()
    ENDDO
    IF KEYPRESS = 24 .OR. KEYPRESS = 5 && arrow key
        @ OPT+7,OPTCOL SAY OPT&SUB
        OPT = IIF(KEYPRESS = 24, OPT+1,OPT-1)
        OPT = IIF(OPT > NUMOPT, 1, OPT)
        OPT = IIF(OPT < 1, NUMOPT, OPT)
        SUB = STR(OPT, 1)
        @ OPT+7, OPTCOL GET OPT&SUB
        CLEAR GETS
        LOOP       && loop if choice not made
    ENDIF
    IF KEYPRESS >= 49 .AND. KEYPRESS <= (NUMOPT+48)
        @ OPT+7,OPTCOL SAY OPT&SUB
        OPTION = KEYPRESS - 48
        SUB = STR(OPTION,1)
        @ OPTION+7, OPTCOL GET OPT&SUB
        CLEAR GETS
    ENDIF
    IF KEYPRESS = 13    && return key pressed
        OPTION = OPT
    ENDIF
    IF OPTION > 0 .AND. OPTION <= NUMOPT
        DONE = .T.
    ENDIF
ENDDO
RETURN
```

LISTING 3 ***(continued)***

Editor's note: Use the dBASE *editor or another text editor to enter MENU.PRG and MAIN-.PRG and save them in the current directory. Type* **DO MAIN** *at* dBASE*'s dot prompt to test the programs. The menu selections are fictitious, of course, so feel free to change them. To create your own menus, take a copy of MAIN.PRG and add PUBLIC variables OPT5 through OPT9. Change the numeral 4 in DO WHILE and DO MENU to your last command number, and add new commands as needed to the CASE statement.*

Antiviral Vaccine

Thomas C. Nelson's batch file commands check for a computer-virus infection ["Diagnosing a Virus," *Star-Dot-Star, PCW,* May 1989]. His idea is great—echoing COMMAND.COM's expected and current lengths can reveal an evil software critter incubating in that file. But I thought letting the batch file make the comparison itself would be more convenient.

I did this by adding the lines in **LISTING 5** to my AUTOEXEC-.BAT file. If the file sizes are equal, the batch file continues. If they differ, execution pauses and an error message alerts you to a possible virus attack. You can then reboot from a fresh DOS master and take steps to eliminate the virus.

Annette B. Gates
Richmond, Virginia

Editor's note: Replace the number 23792 with your COMMAND-.COM file's correct length. To make sure you entered the statements in **LISTING 5** *typo-free, enter an incorrect length the first time, then reboot the system; the virus message should appear. Re-edit AUTOEXEC.BAT, enter the correct value, and save the file. This clever batch program works because COPY rejects a zero-length source file; therefore,*

(continues)

```
* MAIN.PRG

CLEAR
CLEAR ALL
SET PROCEDURE TO MENU
SET TALK OFF
SET BELL OFF
SET EXACT ON
SET DELETED ON
SET CONFIRM ON
SET SCOREBOARD OFF
SET HEADING OFF
SET STATUS OFF
SET SAFETY OFF
SET INTENSITY ON
SET ESCAPE OFF
CLEAR
```

(continues)

LISTING 4: MAIN.PRG demonstrates how to use MENU.PRG (LISTING 3).

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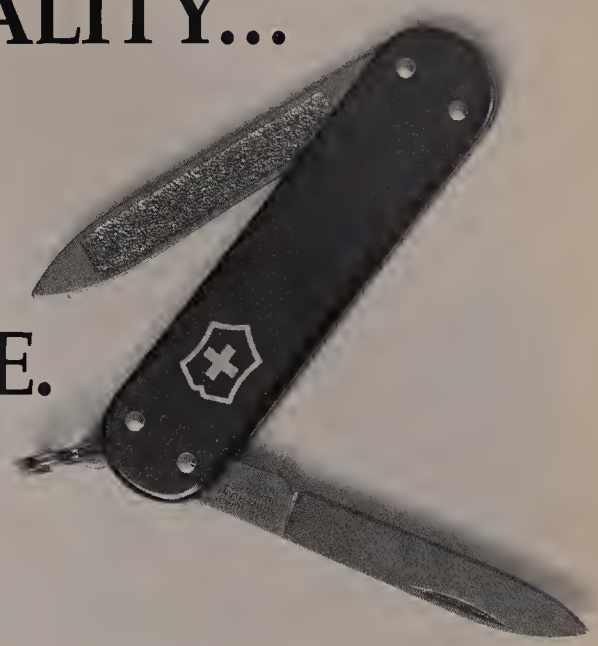

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```
PUBLIC OPT1, OPT2, OPT3, OPT4, OPTHEADER
SELECTION = 0
DO WHILE SELECTION #4
    OPTHEADER = 'MAIN MENU'
    OPT1 = '1. Add Names        '
    OPT2 = '2. Delete Records   '
    OPT3 = '3. Rebuild indexes  '
    OPT4 = '4. Quit             '
    DO MENU WITH SELECTION, 4
    DO CASE
     CASE SELECTION = 1
        @ 23, 1 SAY 'Adding names '
     CASE SELECTION = 2
        @ 23, 1 SAY 'Deleting records '
     CASE SELECTION = 3
        @ 23, 1 SAY 'Rebuilding indexes '
     CASE SELECTION = 4
        @ 23, 1 SAY 'Quitting program '
    ENDCASE
        @ 24, 1 SAY 'Press any key to continue...'
        SET CONSOLE OFF
        WAIT
        SET CONSOLE ON
        CLEAR
    ENDDO
    CLEAR
    QUIT
```

LISTING 4 ***(continued)***

```
ECHO OFF
DIR COMMAND.COM | FIND "23792" > CHKCMD1.$$$
COPY CHKCMD1.$$$ CHKCMD2.$$$ > NUL
DEL CHKCMD1.$$$
IF EXIST CHKCMD2.$$$ GOTO OKAY
ECHO !! Possible virus--bad COMMAND.COM length !!
PAUSE
GOTO CONTINUE
:OKAY
DEL CHKCMD2.$$$
:CONTINUE
REM Batch file continues here...
```

LISTING 5: These AUTOEXEC.BAT commands verify COMMAND.COM's length to check for a possible virus attack.

CHKCMD2.$$$ is created only if FIND "23792" succeeds.

1-2-3 Numeric Alchemy

Recently I had to transfer 200 records from a *1-2-3* worksheet to a *WordPerfect 5.0* merge file. The usual approach—translating the data to DIF format and using the *WordPerfect* Convert utility—works, but omits any currency or percentage formatting. I was going to write a macro to change numbers to labels, but then I found a faster solution.

Instead of processing each cell individually, I took advantage of *1-2-3*'s Print File, File Import, and Data Parse commands to process a range of cells. Using Print File Options Other Unformatted Quit Go commands, I printed the range of numbers to a .PRN file. I then erased the same numbers and, with File Import Text, imported them back into the worksheet. Using Data Parse, I created a Format Line, then selected Edit to change the Vs (Values) to Ls (Labels). Next, I set the input column to include the entire number range—including the format line—and then specified that same range for output, this time excluding the format line. With this arrangement, selecting Go changes the numbers to labels, allowing easy transfer to other programs such as *WordPerfect*. The technique also works in reverse, changing the Ls back to Vs to convert labels to numbers.

I hope *Star-Dot-Star* readers will find these ideas useful. I certainly have gained a lot from theirs!

Anita L. Newton
Mesa, Arizona

Editor's note: This trick works like a charm, although as a final step you may need to realign your newly created column of labels using Range Label.

PROMPTing Around the Clock

In "Booting Around the Clock" [*Star-Dot-Star, PCW,* May 1989], Bob Farland explains how to display the date and time during booting. While his method works fine, I use a different approach that doesn't require a special file or redirection characters. I include the command PROMPT $D THHHHHH_PG in AUTOEXEC.BAT.

The command changes the DOS prompt to display the date ($D), time ($T), a new line ($_), the current path ($P), and > ($G). The six backspaces ($H) erase

(continues)

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the time's seconds and hundredths-of-seconds digits. If you don't want the date and time displayed at subsequent prompts, place PAUSE and PROMPT PG on separate lines immediately after this command. This change will prompt you to press a key and then reset the prompt to show just the drive, current directory, and > symbol.

Rick Hellewell
Loomis, California

Give QuickBASIC Room to Develop

After starting up *QuickBASIC 4.5*, I gain extra program-development elbowroom by pressing <Alt> with the plus key once or twice. This reduces the size of the Immediate window, which I can easily recover by pressing <Alt> with the minus key.

Stephen C. Lenz
Providence, Rhode Island

Tom Swan is a contributing editor for PC World *and the author of* Mastering Turbo Pascal 5.5 *(Howard W. Sams and Co., Indianapolis, 1989).*

Share your tips and discoveries with PC World *readers; see How to Contact PC World, page 4.* ●

DEVELOPER'S TOOLBOX

A UNIX-Like Shell's Bells

I'm always looking for new bells and whistles, but I've struck the mother lode in *PolyShell*, which transforms COMMAND.COM into a UNIX-like DOS shell. *PolyShell* understands UNIX commands such as LS for DIR and CAT for TYPE, and it includes a superior script language that lets even nonprogrammers write quick-and-dirty batch file utilities. Because *PolyShell* enhances but doesn't replace COMMAND.COM, DOS batch files and commands work normally, and applications run exactly as before. You sacrifice nothing for this gold mine of tools.

Before you buy *PolyShell*, be aware that it is *not* UNIX, and it does not add multitasking to DOS. The shell takes a hefty 145K of RAM but shrinks to only 20K when another program runs. I've experienced no conflicts between *PolyShell* and other software, but some programs with exit-to-DOS commands work best when loaded by a special script, as explained in *PolyShell*'s manual.

My favorite tool keeps a "history list" of the last 20 commands entered. I can step through the list with <Cursor Up> and <Cursor Down>, changing the command displayed at the DOS prompt. You can also separate multiple commands with semicolons on the command line and type slashes or backslashes in path names—small but welcome improvements that simplify entering commands.

Other features perk up familiar COMMAND.COM operations. For example, *PolyShell*'s pipe character can send temporary output to a RAM disk, making notoriously slow filters such as MORE, FIND, and SORT fly like the wind. And alphabetically sorted directories display in easy-to-read UNIX-style lowercase, which helps me find file names on a crowded screen.

In addition to its native talents, *PolyShell* comes with a set of workhorse utilities plus extensive on-line documentation. I regularly use GREP (and special-purpose variations) to search files for text patterns at lightning speed. There's also a communications program, a line-oriented ASCII text editor, a file-printing utility, a text-file sorter, a file finder, and file-comparison tools.

Despite all this power, *PolyShell* isn't for everyone. If you know and miss UNIX, then you'll be right at home—*PolyShell* is designed for people who regularly use both DOS- and UNIX-based computers. If you plan to purchase UNIX or Xenix, then *PolyShell* offers a low-cost way to learn the ropes. If you're a power user—and especially if you write code for a living—then I urge you to try *PolyShell*. You'll be amazed at what this single package has to offer. But if you use DOS commands infrequently and spend most of your time with spreadsheets and word processors, you may not need *PolyShell*'s extra abilities.

Over the next several months, I'll be installing an SCO Xenix 80386 multiuser system for a client, and in future columns I'll share my experiences with DOS and Xenix. My original motive for trying *PolyShell* was to prepare for that job. Now I may never go back to plain old DOS commands again.

I welcome your comments. My MCI Mail handle is TSWAN; my CompuServe ID is 73627,3241. —*Tom Swan*

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PolyShell
Polytron Corp.
1700 N.W. 167th Pl.
Beoverton, OR 97006
800/547-4000, 503/645-1150
LIST PRICE: $99 ($148 with PolyAWK)
REQUIREMENTS: 145K, DOS 2.0 or loter version
TECHNICAL SUPPORT: unlimited to registered users, toll-free number, M–F 7–5
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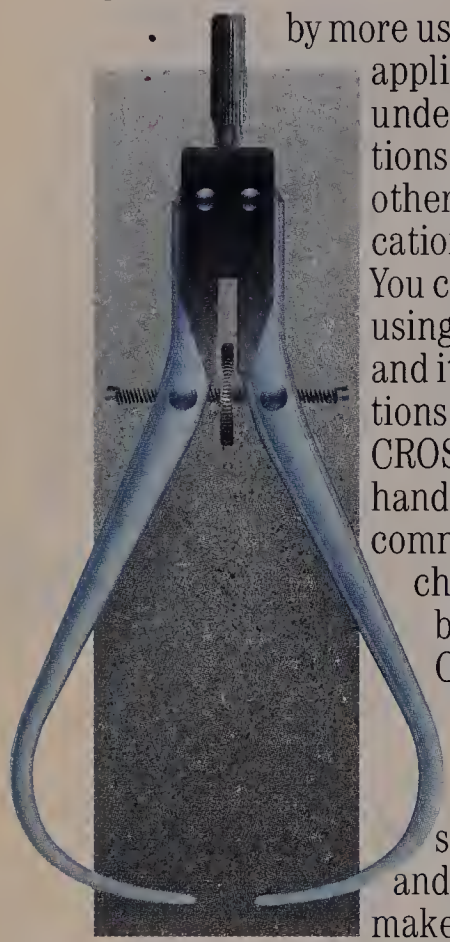

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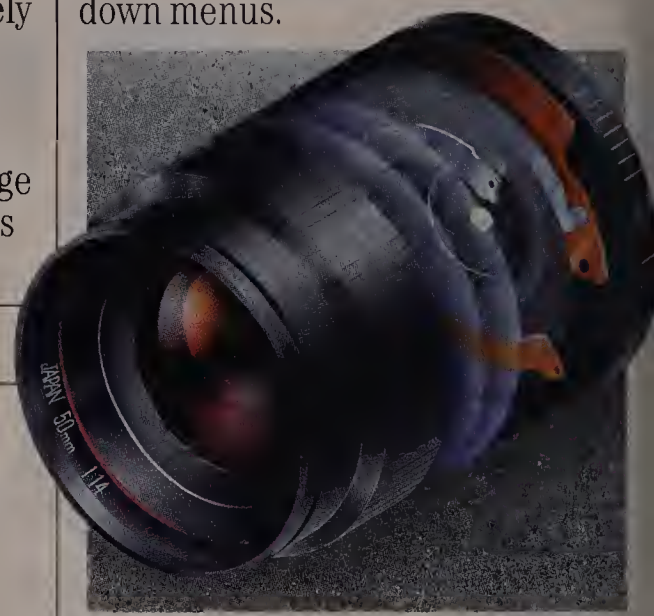

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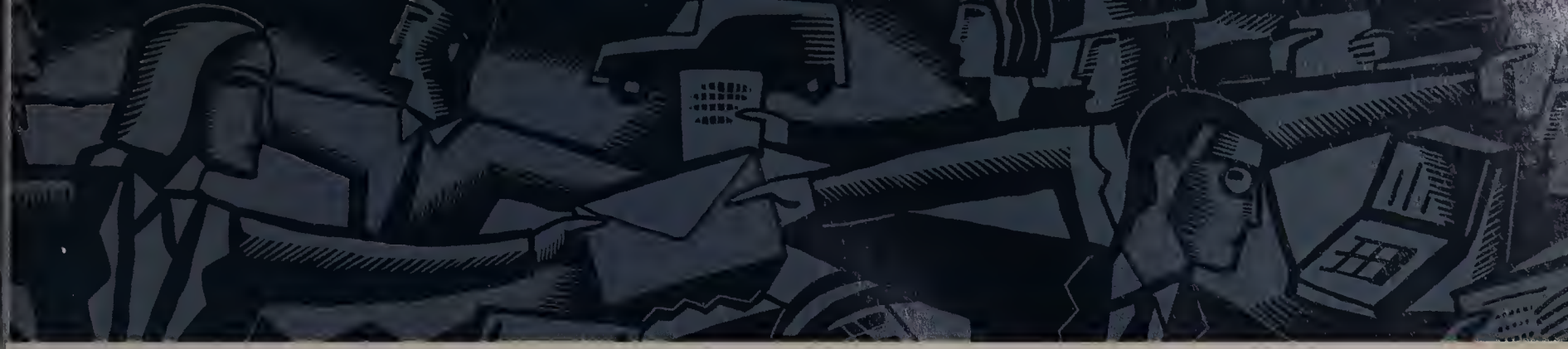

NETWORK Q&A

Tips and strategies for departmental networking

Taming a local printer can test the patience of the toughest power user. Orchestrating a network of printers compounds the headaches. Still, there are solutions.

David Ferris

Q. *Our* NetWare *LAN has grown to 23 nodes, and we're moving from one shared printer to three. What are our options for setting up print queues? Do we need to set up a dedicated print server? What other printing problems should we watch out for?*

Delvin O'Brien
Pittsburgh, Pennsylvania

A. Sharing printers is one of the main reasons for buying a LAN. Yet printing snags often consume 20 percent or more of an administrator's time. With planning and training, you can sharply reduce this figure.

Here's how network printing works. As usual, each application prints to the PC's printer port, but the LAN operating system (LAN OS) redirects the print request to a program on the print server called a spooler. To prevent a printing traffic jam, the spooler stacks the print jobs in one or more queues and sends the files to one or more printers. If the printer is busy, the spooler temporarily saves jobs to disk. Some spoolers store data in RAM buffers for faster access.

Beyond that, the sophistication of spoolers varies. Most let users check on the progress of their job in a print queue via LAN OS utilities such as *NetWare*'s Printcon and Pconsole and cancel the job before it prints. Others let priority users cut in line. Some notify users of printer errors and finished jobs.

The problem with most spoolers is that they're inconvenient and tough to master. Even if users are shielded from command syntax with batch files or the LAN OS's spooler utilities, complexity still creeps in. For example, to switch printers or check on a queue, users must exit their application.

Fortunately, *NetWare* users can call on third-party RAM-resident utilities that bring network printing control to every user from within any application. Many obstacles can be solved with pop-up TSRs such as LAN Systems' *LANSpool*, Brightwork Development's *PS-Print*, and Network Enhancement Tools' *PrintTamer*. These utilities not

(continues)

```
QueueIT!, Version 1.0, (C) Copyright 1987-89, Brightwork Development Inc.

LPT1: BW1/PRINT_0
LPT2: Set to local device
LPT3: Set to local device

                Edit Print Job Configuration

     Copies: 01   (0-99)          Form Name: S8x11_White
  Form Feed: No   (Y/N)         Print Banner: No    (Y/N)
  File Type: Byte Stream         Banner Name:
   Tab Size: 00   (1-18)         Banner File:

        LPT: 1    (1-3)       Enable Timeout: No    (Y/N)
Auto EndCap: Yes  (Y/N)              Timeout: 000   (0-255)

Server: PRINT_0
 Queue: PostScript
Device: HP LaserJet
  Mode: Standard Printing

<Enter>-Change Value, <Esc>-Abort, <Ins>-Capture, <+>-NPrint, < →>-Select
```

The QueueIt module of PS-Print provides numerous options for selecting queues and forms and lets you issue formfeeds, time-outs, and end-of-file characters from within problematic applications.

ANTHONY RUSSO

only provide spiffier RAM-resident front ends for *NetWare*'s print utilities but also offer menu support for other printing tasks that would normally require mastery of command syntax. In addition to letting users manipulate queues, they let you select printer setup commands from menus and share local printers. Careful planning can limit future printing hassles. Here are some installation tips and solutions to common problems.

Testing and Training Thoroughly test each application and printer over the network. Create batch files so users don't have to remember spooling commands. Better yet, set up menu front ends using a menu-building utility, or load printer utilities on each user's PC.

Document the most essential printing practices for users. Specify how to select each printer from each program, how to cancel jobs, and how to check a queue. Don't forget basics like changing ribbons and clearing paper jams. Finally—forgo this step at your peril—provide corresponding hands-on training.

Print Server or File Server? On most LANs the file server can also handle print server tasks. With larger LANs, however, you may want to off-load print spooling to another PC to improve printing and LAN performance. In addition, a dedicated print server lets you control the printer locally (difficult on a busy file server).

Because a printer can only be cabled a short distance from its connected PC, hanging printers off a file server restricts your options. By placing a print server in a central location or tying some printers to the file server and others to a print server, you can improve access. You can also install a line driver, which for around $150 will extend printer transmissions by hundreds of feet.

The drawback to using a print server is that you'll have to dedicate a PC to the task and buy another copy of the LAN OS to install on it. *NetWare* users have another option: *PS-Print* and *LANSpool* enable any PC on the LAN to act as a print server. Because spooling occurs on the file server, net performance won't improve. But you won't need to install another copy of *NetWare*, and because the host print utility soaks up only a few K, you don't have to dedicate the PC to server tasks.

Queue Decisions How many spool queues should you set up per printer and how many printers per queue? You should probably install a queue for each printer type. If you have two printers of the same kind, such as two LaserJets, they can share a queue. If a printer has multiple bins for different forms and paper sizes, you can assign a queue to each bin. You could even set up queues by priority, so high-priority users are routed to an express line.

Single-User Versus Multiuser Don't run a single-user program as a multiuser application. You will encounter printing bugs and file access conflicts, and you will probably break your licensing agreement.

Even if each user has his or her own single-user application, you'll encounter more problems than you would with a multiuser package. For example, you can set up multiuser programs so that only administrators can change parameters such as tab settings or permanent fonts, thus avoiding confusion.

No End-of-File Character Many single-user programs don't send an end-of-file character at the end of a print job. The result? The spooler won't queue the job, so users have to exit the program and issue a command such as *NetWare*'s Endcapture.

One solution is to specify a time-out to the spooler, so it inserts an end-of-file character if nothing is received for a set period of time. Usually, a 5- to 10-second time-out should do, but graphics programs may need much longer time-outs.

No Formfeed Some single-user programs don't send a formfeed at the end of a job, so two jobs print on the same page. The usual fix is to have the spooler insert the formfeed, but then programs that do issue a formfeed will churn out a blank page. The answer? A pop-up utility such as *PS-Print* will let users send a formfeed from applications that don't.

Conflicting Print Buffers Sometimes print buffers are provided by the application, the PC, the server, and the printer. But more is not merrier. Often, conflicts and delays occur while buffers wait for one another. If problems occur, you may have to disable some of the buffers.

Print Settings Are Wrong You take the long hike to the printer and find your report has inexplicably printed in compressed type. Most likely, your application didn't send a printer reset string, so the printer kept to the settings of the previous job. To avoid this, use a print utility to send a printer reset, or have your spooler automatically send one before each job.

Garbage Output If the printer churns out garbled text, or if only a few odd characters print per page, see if you printed a binary file. If not, you may have selected the wrong queue—for example, you may have tried to print on a LaserJet when linked to a dot matrix.

Laser Font Is Wrong Often, a file prints in a laser printer's default Courier font when you've specified another font. It could be that the font wasn't installed, the printer's buffer was full, or there were too many fonts per page (the LaserJet II limits you to 16).

It's usually best to limit font duties to an administrator who downloads a set of fonts every day. If users want to load others, they should select temporary downloading options, so the fonts disappear after each job. Also note that some single-user programs (for example, *Ventura Publisher*) won't let you download fonts across a LAN.

Network printing may never become easy, but with proper planning and training (and a few helpful utilities), you can make it almost as manageable as using a local printer.

WHERE TO BUY

LANSpool 1.57
LAN Systems, Inc.
300 Park Avenue S
New York, NY 10010
800/458-5267, 212/995-7771
LIST PRICE: $395 per server
Reader service no. 745

PrintTamer 2.1x
Network Enhancement Tools
P.O. Box 271105
Houston, TX 77277-1105
713/974-1810
LIST PRICE: $195 per server
Reader service no. 746

PS-Print
Brightwork Development
P.O. Box 8728
Red Bank, NJ 07701
800/552-9876, 201/530-0440
LIST PRICE: $595 per server, NetWare ELS 2 version $295 per server
Reader service no. 747

David Ferris is the president of Ferris Networks, a San Francisco–based PC dealer specializing in networks.

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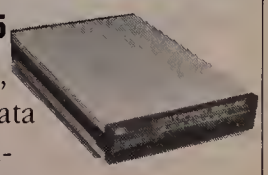

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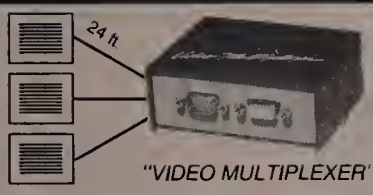

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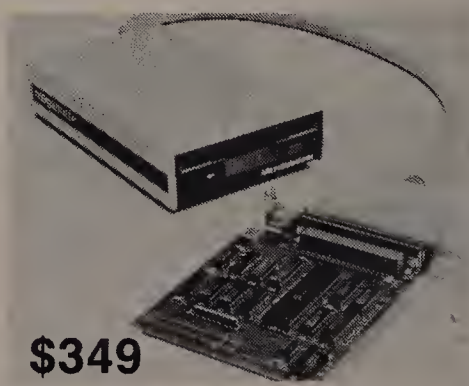

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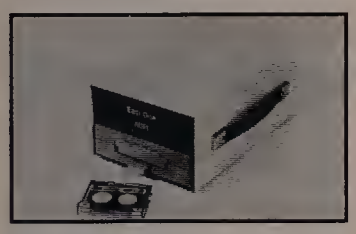

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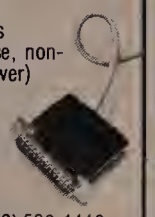

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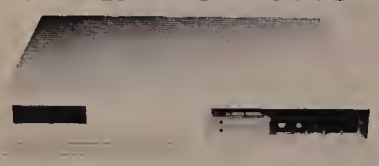

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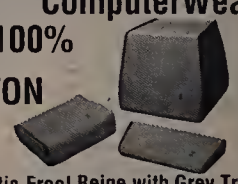

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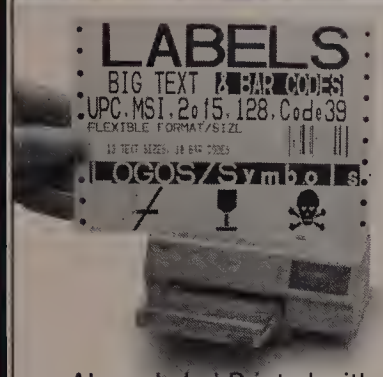

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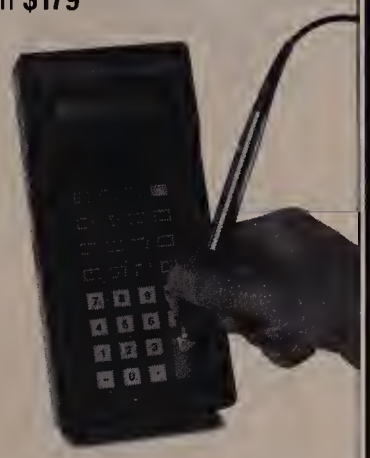

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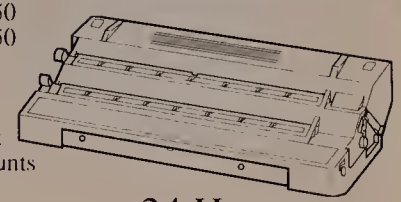

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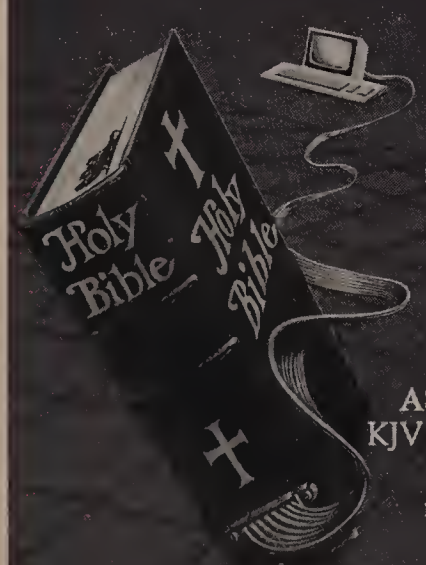

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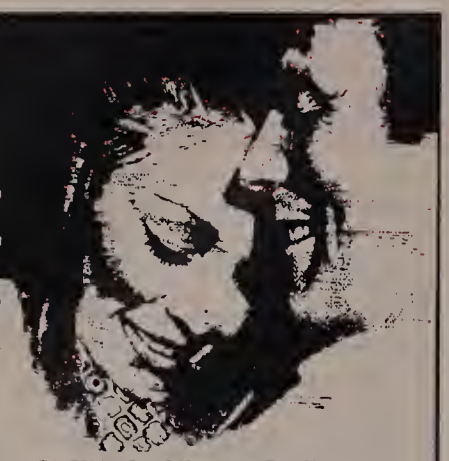

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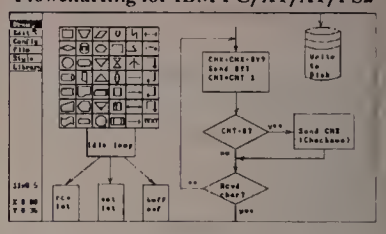

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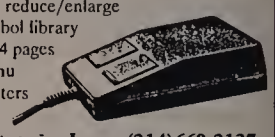

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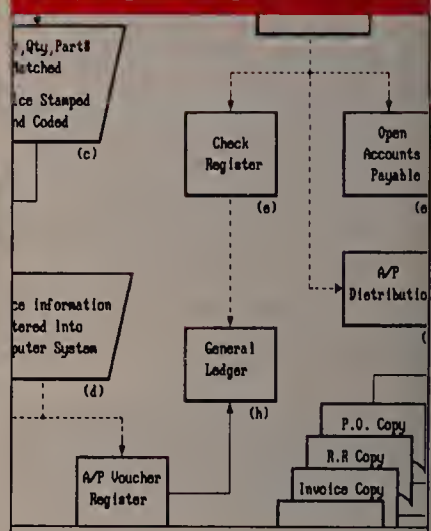

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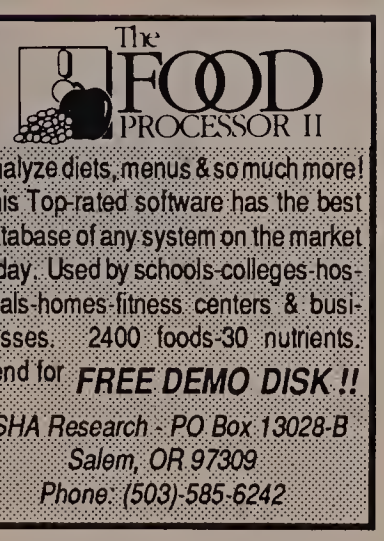

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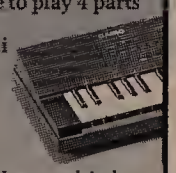

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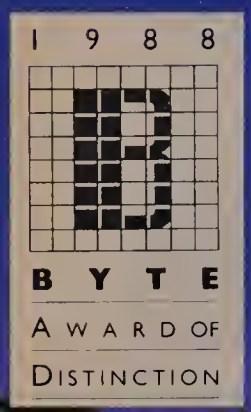

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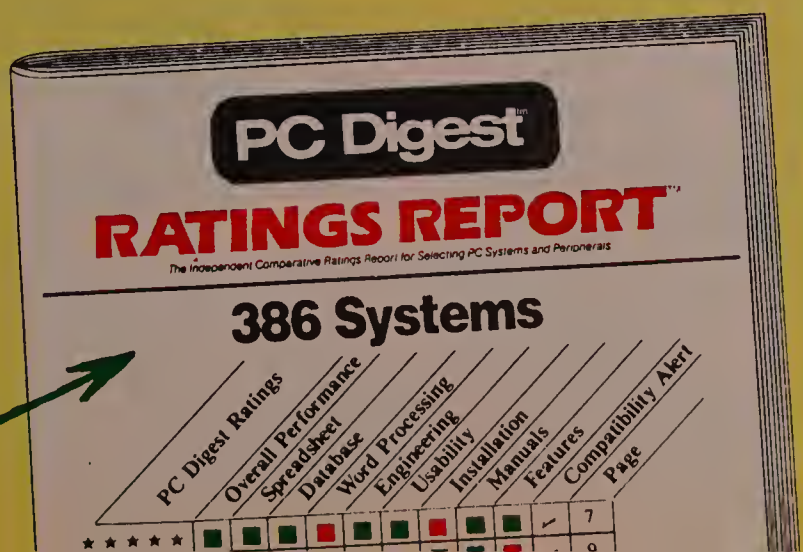

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Programming

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Quick Basic	60
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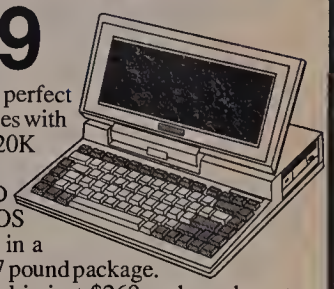

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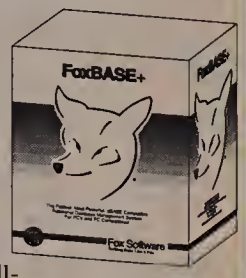

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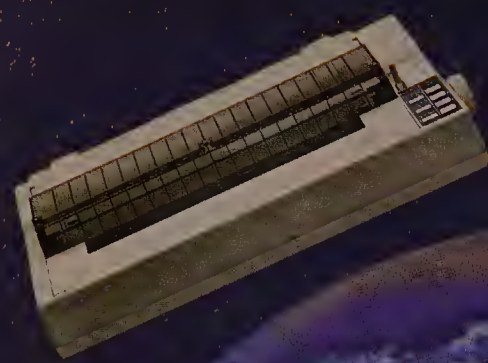

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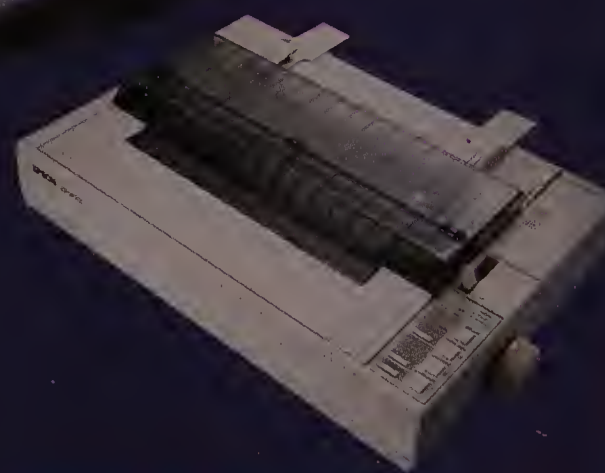

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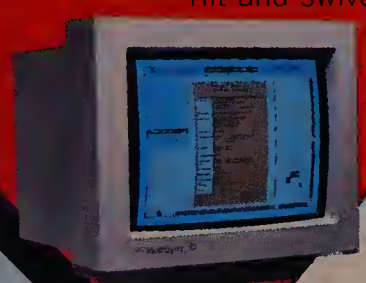

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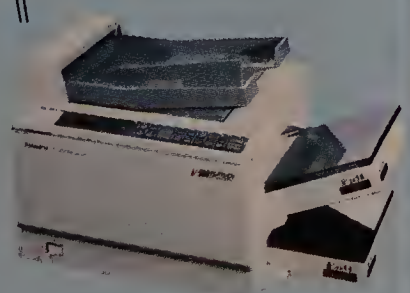

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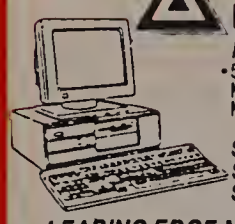

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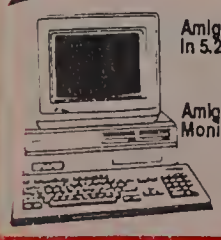

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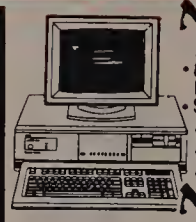

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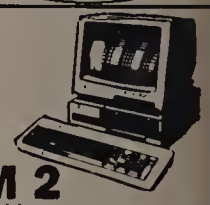

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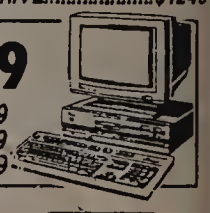

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- 1.2MB floppy drive
- 1:1 interleave HD/FD controller supports 720K, 1.44MB, 360K drives
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- Enhanced 101 key keyboard
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- OS/2, UNIX, XENIX, NOVELL compatible

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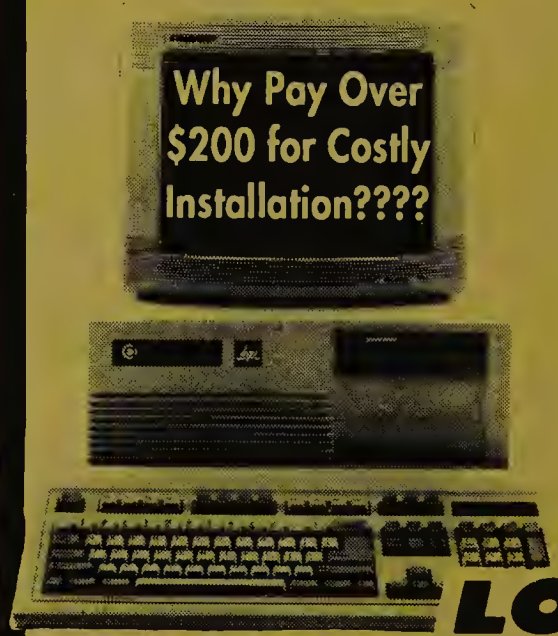

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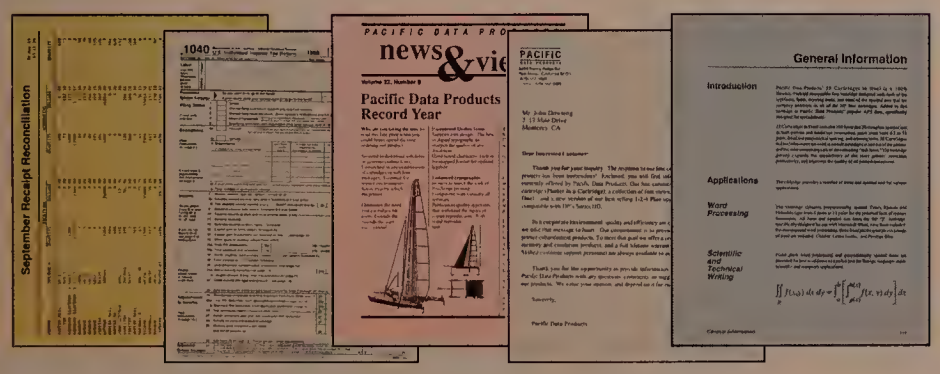

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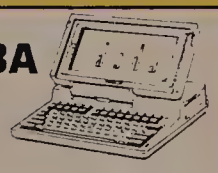

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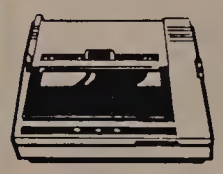

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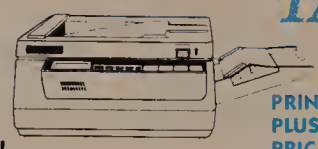

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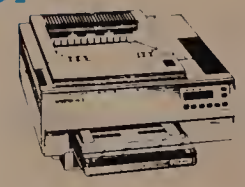

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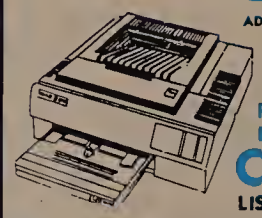

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It's Time to ZIP Ahead

Bob Mahoney

When Walter Cronkite finally wore a paisley tie on the evening news, I knew that paisley was no longer haute cravat. It would soon be replaced by a new fashion, a better idea in men's neck wear.

In the world of on-line communications, the old ARC standard for compression of downloadable files on bulletin boards is the equivalent of the paisley tie. Despite the trauma associated with embracing any new software fashion, PKWare's new ZIP file-compression standard is finding its way onto more and more bulletin boards around the country, supplanting the fusty ARC faster than anyone could have imagined.

ZIP is the next step in the evolution of file-compression software. I find that ZIP compresses files 50 percent faster than System Enhancement Associates' ARC. It also shrinks files considerably smaller than ARC does—an average of 15 percent smaller. For a bulletin board operator like me, whose system boasts 2GB of downloadable files, using ZIP means notable savings in money and disk space.

Nonetheless, when ZIP was introduced a year ago, I thought twice before abandoning ARC for this stripling compression format. How long would it take me to convert that whalelike 2GB of files from ARC format to ZIP? What would my users say when they found that their old compression software no longer worked? Would they log off for good?

It took me a total of 50 hours to convert all 2GB of files from ARC to ZIP—or rather, it took one of my backup PCs that long, using one of the many public-domain automatic conversion utilities that materialized soon after ZIP. When it was all done, I found myself with an extra 300MB of available disk space—a cool $2000 worth of disk saved by the conversion.

I needn't have worried about my bulletin board subscribers' resenting the change. The many PC old-timers who call the system enjoyed the controversy; they appreciate all hardware and software evolutions. But to my surprise, even the pollywog PC users still sorting out the arcane secrets of modems and modulations accepted the new ZIP files with hardly a twitter of protest. Few complained, and no one canceled a subscription.

I have never seen so many PC users get so hysterical over a simple evolution in software technology as bulletin board operators have been over the migration from ARC to ZIP. Continued squabbling over System Enhancement Associates' suit against PKWare (now settled) combined with lack of information about ZIP's virtues have led to the brouhaha. I'll gladly take the $2000 worth of hard disk space that ZIP has saved me—and I can't even guess how much it has saved my users in time and hardware. Like the paisley tie, ARC has been outdated by a style of superior value. ●

Bob Mahoney runs the Milwaukee-based Exec-PC BBS (414/964-5160), which has 90 phone lines and subscribers from 30 countries.

Have a different perspective? Write Dan Lavin, User Ombudsman, PC World, 501 Second St., San Francisco, CA 94107.

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Now you can put that older and slower IBM©, Compaq©, or Apple© to better use. Your old system may be worth a thousand dollars or more. Our new Trade-Up program allows you to move up to the latest technology for less. Call one of our systems consultants for complete details.

4. 30 day money back guarantee

Your total satisfaction is our goal. If for any reason you are not completely satisfied with the 325ET you may return it within 30 days for a full refund.

5. Easy financing available

We offer both consumer credit for individual purchases, and leasing for business customers. Call us today and find out how easy it is to own the next generation of computers.

To Order or Inquire, Call:

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PRIORITY 1 ONE COMPUTERS®

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Circle 231 on reader service card

Curtis Surge Protectors Are Superior And Here's The Proof.

New UL 1449 Tells All.

Underwriter's Laboratories, Inc. (UL), developed a New Standard called UL 1449 to provide consumers and dealers with an objective guide to the performance of surge protectors. Surge protectors work by "clamping" a power surge the moment it occurs, thereby controlling the amount of voltage that will pass through to your electronic equipment. The less voltage that gets through after clamping occurs, the more effective the protection.

UL didn't just give Curtis a superior rating because our products look nice. They subjected Curtis Surge Protectors to 26 power surges of 6,000 volts each and then measured the amount of let-through voltage. As the chart below shows, Curtis Surge Protectors not only survived, they passed with flying colors!

Curtis Surge Protectors consistently delivered the highest levels of surge protection. (For detailed brochure, see offer below.)

If you want superior performance plus maximum protection, the results speak for themselves.

UL 1449: Your New Surge Protection Standard. Curtis Surge Protectors: Your Choice.

FREE SURGE FACTS! Get the facts on surge protection. Send for a Free Brochure: "Surge Protection and the New UL 1449 Standard."

Curtis products are available nationally from leading Distributors and Wholesalers. **For further information call Curtis at 603-532-4123 Ext. 9**

Important Information!

UNDERWRITERS LABORATORIES HAS DEVELOPED A TEST TO SHOW THE MAXIMUM VOLTAGE THAT CAN PASS THROUGH A SURGE SUPPRESSOR AFTER CLAMPING HAS OCCURRED.

1449 LISTED

LOWEST VOLTAGE RATING													HIGHEST VOLTAGE RATING
330	400	500	600	800	1000	1200	1500	2000	2500	3000	4000	5000	6000

Curtis Surge Protectors are rated at 400 Volts Peak or less by Underwriters Laboratories Standard 1449 for maximum transient let-through voltage.

WARNING: All surge suppressors are not lightning arrestors and will not provide protection against a direct lightning strike.

1985 Underwriters Laboratory Inc.

Manufacturing Company, Inc.

CURTIS

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